MEMORANDUM
RM-6183-PR
DECEMBER 1969

THE IMPACT OF THE WEIGHTED GUIDELINES PROFIT SYSTEM ON DEFENSE CONTRACT FEES

G. R. Hall

PREPARED FOR:
UNITED STATES AIR FORCE PROJECT RAND

The RAND Corporation
SANTA MONICA • CALIFORNIA

60

MEMORANDUM

RM-6183-PR

DECEMBER 1969

THE IMPACT OF THE WEIGHTED GUIDELINES PROFIT SYSTEM ON DEFENSE CONTRACT FEES

G. R. Hall

This research is supported by the United States Air Force under Project RAND—Contract No. F44620-67-C-0015 – monitored by the Directorate of Operational Requirements and Development Plans, Deputy Chief of Staff, Research and Development, Hq USAF. Views or conclusions contained in this study should not be interpreted as representing the official opinion or policy of the United States Air Force.

The RAND Corporation

1700 MAIN ST • SANTA MONICA, CA 90406

PREFACE

This study is part of RAND's program of research on the weapons system acquisition process and more particularly on defense profit policy. RAND studies (e.g., I. N. Fisher and G. R. Hall, Risk and the Aerospace Rate of Return, RM-5440-PR, I. N. Fisher and G. R. Hall, Defense Profit Policy in the United States and the United Kingdom, RM-5610-PR, and G. R. Hall, Defense Procurement and Public Utility Regulation, RM-5285) have examined various aspects of defense profits. The present study focuses on the fees paid by the Government for defense contracts and how these fees were affected by the major change in profit policy as the result of the introduction of the weighted guideline system in 1964.

SUMMARY

In 1964 the Department of Defense introduced the weighted guidelines system (WGLS) to compute the fees paid contractors for negotiated contracts. To determine the target fee, a percentage is computed and applied to the target cost. The appropriate percentage depends upon the nature of expected costs. For example, a contract with considerable in-house scientific or engineering work will yield a higher target fee rate than one for ordinary "metal bending".

The WGLS reflects the pre-1964 concern with profit pyramiding; but it also has broader objectives. WGLS is intended not only to prevent profiteering, but also to insure that profit opportunities in the defense sector are sufficiently attractive to maintain a healthy industrial base.

This study examines the impact of the weighted guidelines system on the average target fee rates for the contracts held by major defense firms, as well as on actual fee rates and the earnings on contractors' assets. Extensive data are available on target fees; the sample used in this study covers 10,054 negotiated contracts. Data on actual fees and profits are fewer and less complete; so conclusions must be regarded as tentative. Even so, some implications can be drawn about the contributions of WGLS toward the achievement of profit-policy objectives. These are outlined in Sec. IV.

The weighted guidelines system led to higher average target profit rates on contractors' portfolios of contracts, grouping individual contracts by contractors. Sample A, consisting of firms on the 1967 list of the 100 largest defense contractors, had a relatively larger increase in fee rates than Sample B, consisting of all other defense contracts. In the pre-WGLS period, the average target fee rate was 7.7 percent for Sample A and 8.2 percent for Sample B. Post-WGLS rates were 9.7 percent for Sample A and 9.1 percent for Sample B.

There were substantial differences in the experiences of individual firms. About a quarter of these in each sample had a decline or no change in their average contract portfolio target rates. Nonetheless, in general, Sample A firms did better throughout the entire

distribution, except at the extreme high level of rates, in which area there were more Sample B firms.

There was considerable dispersion in average fee rate changes for different products and types of contracts. Nonetheless, an index number analysis reveals that a secondary effect of implementing the WGLS was an approximate 10-percent increase in target fees for WGLS procurements.

If the goal of the WGLS was to increase profit opportunities by providing higher fee levels, the objective was achieved. If the goal was to provide a wider distribution of average fees, this too was achieved. But it should be noted that, while all classes of firms on average benefitted, the benefit to larger contractors was greater.

If the goal was to increase actual fees, rather than targets, it would appear that the goal was not achieved, although the evidence here is not sufficient to permit a firm judgment. If the goal was to raise the profitability of defense investment, the results appear to have been mixed, and on the whole unsuccessful.

ACKNOWLEDGMENTS

Extremely helpful information about the data analyzed in this study was provided by S. C. Zark and G. Timberlake of the Directorate for Statistical Services, Office of the Secretary of Defense. At RAND, suggestions and comments were provided by J. A. Dei Rossi, D. DiSalvo, I. N. Fisher, R. E. Johnson, and E. O. Olsen. The assistance rendered to him is much appreciated, but the author retains full responsibility for all analyses and conclusions.

CONTENTS

I. INTRODUCTION

This study examines one aspect of the many-faceted and complex subject of defense profits--the defense contract fees negotiated by the Department of Defense, and how these have changed since the introduction in 1964 of the weighted guidelines system (WGLS) for computing fees. An attempt was made to examine actual ("coming-out") fees as contrasted with target ("going-in") fees. Also, a preliminary attempt was made to examine the relationship between contract fees and the rate-of-return earned on capital--a more meaningful measure of profits. Unfortunately, data limitations restricted these latter investigations to preliminary and inconclusive forays; so the bulk of the study is concerned with target fees. However, target fees are significant, because their level and changes affect the profit potential and thereby the economic attractiveness of the defense sector.

A few definitions are important. This study is limited to contracts priced by analyzing and estimating the expected costs of fulfilling the contractual obligation. Such contracts account for the bulk of the military expenditures for specialized defense goods and services. But it should be kept in mind that expected or actual profits on contracts let by price competiton are excluded.

After the expected costs are estimated, a target fee rate is determined by a procedure to be described later. This fee rate is applied to the target cost to yield the target fee. This is commonly referred to as the profit rate; but it should be noted that this fee rate is a profit on cost, rather than on capital. "Profit" in financial and economic analyses is usually expressed as a percentage of a company's assets, or net worth. For reasons to be described in Sec. II, this has not been the practice in the defense sector. Defense fees have been reported as profit-on-cost, and the lack of alternative sources of data explains why this particular measure occupies the major role in this study. The difference between fee rates (target profit-on-cost) and the conventional profit rate figures (actual earnings on assets or net worth) should be kept clearly in mind. However, because the Department of Defense is concerned with appropriate

adjustments to fee rates, it is relevant to ask how target fees are distributed by company. It is also relevant to examine the impact on target fees of the last major change in DOD profit policy, the introduction in 1964 of the WGLS. Following the historical and policy descriptions, both these questions will be addressed.

II. HISTORICAL BACKGROUND

INTRODUCTION

When the United States Government wishes to alter the degree of financial attractiveness of defense business, it changes the fee rate. There is, of course, a direct relationship between the fee rate on cost and the profit rate on capital; i.e., $\pi/K = (\pi/C)\ (C/K)$* where π stands for profit and C and K for contract cost and capital respectively. The distinction between a profit policy that operates on the fee rate and one that operates on the rate of return on capital investment is nonetheless a meaningful one for public policy purposes. The distinction can best be explained by examining the history of public policy towards defense profits, starting with World War I.

WORLD WAR I TO WORLD WAR II

Since World War I, the defense establishment has viewed profit policy primarily as one element of the procedure for pricing specific procurements--that is, primarily as an element of pricing policy, rather than a device to control the financial situation of the defense sector.** During World War I the "profiteering" possible when the demand for military goods and services exceeded the capacity to produce them led to passage of various excess profit taxes.*** Some of these merely applied graduated rates of taxation to income; but one act applied the tax to the profit in excess of the average during the period 1911 to 1913, or to the profit in excess of 10 percent on

---

* π/K will ordinarily be referred to as the profit rate and π/C will ordinarily be referred to as the fee rate in this study.

** The history of defense profit policy is summarized in R. C. Osborn, "Background and Evolution of the Renegotiation Concept" in J. F. Weston (ed.), Procurement and Profit Renegotiation, Wadsworth Publishing Company, Inc., San Francisco, 1960, pp. 13-42.

*** The inelasticity of the wartime demand for military goods made the potential profits quite high but, even had the demand been elastic, the inability to increase supply as fast as demand was increasing would have led to the "excess profit" problem.

invested capital, whichever was greater.* This was the last time that rate of return on investment figured directly in defense profit policy.

After World War I, the military reverted to the traditional posture of producing specialized military hard goods in Government-owned facilities and of relying on private firms for commercial items, or "GI" versions of civilian products. For such products, competition could usually be obtained by advertising the contract and awarding it to the lowest bidder. The expected or actual profit of the contract winners was not of public concern.

During the 1930's, however, the Government increasingly turned to private firms for specialized military items, such as ships and aircraft. It was difficult to obtain price competiton for these procurements; and so the contracts were negotiated on the basis of actual or expected costs. As a rule these contracts were regarded as unique cases. The tendency was to adopt specific solutions to the immediate problem of determining the price of a particular contract, rather than to attempt to establish some general system or principle for determining profits in situations where the Government had to buy in noncompetitive markets.**

For example, in 1934 the Vinson-Trammell Act authorized naval expansion. The act limited the fee rate on contracts let for ships and naval aircraft to 10 percent of the contract price; and required inspection and audits of corporate costs. The act was amended at various times to include other items, such as Army aircraft; and the fee maxima were changed several times. Vinson-Trammell rules were integral parts of the method used to establish the price the Government would pay for the products it procured. Because the prices were based on actual or expected costs, it was natural to express the fee rules as percentages of costs. Furthermore, because the rules tended to be propounded in connection with a specific authorization for a military force-structure change, the focus of attention was the specific

---

*Ibid., pp. 24-27.

**J. P. Miller, Pricing of Military Procurements, Yale University Press, New Haven, Conn., 1949, pp. 163-168.

contract or set of contracts authorized. The major interest was in the price of the expected procurements, rather than in the financial condition of the prospective contractors, provided that profits were high enough to interest enough firms in Government business, and so assure that military goods would be available.*

WORLD WAR II AND RENEGOTIATION

World War II changed the defense profit situation. As during World War I, inelastic demand exceeded capacity, and high profits were easily obtained. The response was not the excess profits tax approach but rather a series of renegotiation statutes. The essence of renegotiation is that a firm's defense business is subject to review of actual, as opposed to prospective or expected, profit experience. However, it was never clear whether World War II renegotiation policy was directed to an overall look at profit experience, or was intended to be a repricing of individual procurements.**

The first Renegotiation Act, approved April 28, 1942, called for a renegotiation clause in contracts and subcontracts of more than $100,000. The clause provided for recovery of excessive profits "realized or likely to be realized"; but no quantitative standard was legislated. Amendments to this act clarified the intent of Congress. Renegotiation was to be on a yearly basis, rather than being restricted to individual contracts. Costs were to be interpreted in terms of expenses allowable for income tax purposes. In general, renegotiation was to be directed at limiting the overall profits of defense contractors to some "reasonable" figure rather than repricing individual procurements.

---

*To protect itself against dangers due to profits on Government sales being below profits on civilian roles in wartime, provision has been made (and sometimes used) for requisitioning facilities directly if contracts cannot be negotiated. In peacetime such procedures have occasionally been threatened but no examples of actual use of direct commandeering of facilities come to mind.

**Osborn, pp. 38-41; Miller, p. 174.

In practice, renegotiation did not perform its intended function. The administration of the various acts and amendments was such that renegotiation actually resulted in the repricing of individual contracts.* As mistakes are almost certain when forecasting the volume of production at a factory, or the costs of producing a new and perhaps technically unproven weapon, renegotiation came to be a procedure for rectifying errors in the original cost estimates, on which the original prices were based.

Renegotiation played a valuable role in wartime procurement; but it became basically a method of evaluating the reasonableness of actual fees (profit on actual cost) using the initial negotiated fee and target cost as the standard.

Renegotiation statutes did not specifically require that such a criterion be applied. At one time it appeared to be the intent of Congress to develop and apply a broader standard upon which to evaluate the defense firms' net revenues. For example, the 1944 amendments contained seven paragraphs listing standards to be considered. Among these were the contractor's pre-war earnings, the risk, contractor efficiency, the type and extent of subcontracting, turnover rate, capital employed and the contractor's net worth, together with "such other factors the consideration of which the public interest and fair and equitable dealing may require...."**

The Renegotiation Board rejected any attempt to establish a formula or set procedure to define excessive profits. A Navy history of renegotiation puts the renegotiation procedure in a nutshell: "The

---

*Miller argues that, as the war progressed, renegotiation became increasingly removed from the pricing function (p. 187); by contrast, Osborn believes that "In spite of amendments to the renegotiation statutes, the original philosophy of repricing and the policies of those administering renegotiation have appeared to remain unchanged," p. 40. Osborn's position is more persuasive. While renegotiation became administratively separated from the procurement function, there does not appear to have been the same shift from the issue of whether the price paid was "reasonable" to the questions as to whether profit levels of defense contractors were "adequate" or "excessive."

**Quoted in Miller, p. 177.

profit expressed as a percentage of sales came to be used as the principal measure of profitability, to be adjusted up or down in accordance with the Board's judgment of the factors in the case."*

Post-World War II profit policies and procedures have retained many wartime features. The Renegotiation Board is now physically and organizationally removed from the Pentagon and from its procurement processes; yet the basic nature of renegotiation remains unchanged. The statutory authorizations remain broad. For example, Section 102 of the 1951 Renegotiation Act states that the "The term 'excessive profits' means the portion of the profits derived from contracts ... and subcontracts which is determined in accordance with this title to be excessive."

The title then lists six factors: "(1) reasonableness of costs and profits with particular regard to volume of production, normal earnings, and comparison of war and peacetime earnings," (2) net worth and the source of capital, (3) risk, (4) contribution to the defense effort, (5) character of the business, subcontracting, turnover and so forth, and (6) other factors determined by the Board.** The Board interprets these factors to preclude any "formulae or pre-established rates" for excessive profits.*** Excessive profits are determined by judgment on a case-by-case basis.

Two other continuing features of renegotiation are the focus on the ratio of fee to costs and the focus on specific contracts rather than on firms as a whole. The Board states that "For the purposes of renegotiation, profits are defined as the excess of the amount received or accrued under renegotiable contracts and subcontracts over the costs paid or incurred with respect thereto and determined to be

---

*Quoted in Osborn, p. 40. This concern with the fee rate would have been consistent with a broader standard of profit adequacy, had capital output ratios been considered. There is no indication, however, that they were.

**Renegotiation Board, Tenth Annual Report, 1965, U. S. Government Printing Office, Washington, D. C., 1966, pp. 2-3.

***Ibid., p. 3.

allocable thereto."* Excessive profits are defined in relation to contract costs. The capital required to produce the product may influence the Board's determination of whether the actual target rate or fee the firm earns should be lowered; but the Board is not primarily concerned with rate of return on assets or net worth.

It is the profit on renegotiable contracts that is at issue, not the contractor's overall profit. The enabling legislation exempts certain types of contracts from renegotiation; so the Board could not, even if it wished to, apply renegotiation to all Government business of a given contractor, let alone to his total Government and civilian business. Nonetheless, because the point is often misunderstood, it is important to emphasize that renegotiation involves only certain contracts, and not the total profits of defense firms.

In short, what the present renegotiation system provides is a second crack at one of the procurement pricing tasks--determination of the margin between the price the Government pays a contractor for some good or service, and the costs (including overhead) the contractor incurs in producing it. The Renegotiation Board considers costs on the basis of the tax definitions, rather than the more restrictive procurement definitions. It can examine all renegotiable contracts held by a firm; and it has the benefit of hindsight. Thus, it is in a good position to set price. However, the point is not what the Board does, but what it does not do. What it does not do is to insure that defense contractors receive adequate profits.

WEIGHTED GUIDELINES**

The World War II approach of treating profit policy as an adjunct of the pricing of individual procurements was carried over into the

---

*Ibid., p. 2.

**For a description and history of the WGLS see the thesis by R. C. Bell and R. B. Garr, An Analysis of the Motivational Effects of Weighted Guidelines, SSLSR-35-68, School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio 1969. This study also reports the results of a survey of contractors that call into question the motivational impacts of WGLS.

postwar period. For example, the Armed Services Procurement Act of 1947,* still the basic procurement statute, mentions profits only under the section authorizing various types of contracts and prohibiting cost-plus-a-percentage-of-cost contracting. Even there, the only statement about profits is that the fee for a cost-plus-fixed-fee contract is not to exceed 10 percent unless it is for R&D, for which 15 percent is the maximum.**

The distinction between viewing profit policy as a separate issue and viewing it as an adjunct of contract pricing is subtle, but important. In the case of an individual contract negotiated in a nonprice competitive environment, the potential for socially inappropriate profits is high. On the one hand, the Government may have a monopsonistic position relative to the producer of a defense product, with no alternative civilian market existing. On the other hand, with respect to follow-on procurements, or procurements of highly specialized items, the Government may be dealing with a monopolist. Prices determined in accordance with relative bargaining strengths might well be too high or too low. Therefore, procurement prices are determined in such cases by analysis of expected costs, and administrative rules are established for determining allowable target profit rates. If one views the profit problem merely as the mechanical problem of assuring that some legal allowance is made in cost-based prices for a fee, in the long run too many firms may leave the defense industry because of inadequate financial opportunities; or else, excessive profits may be enjoyed by those who have an established place in the defense sector.

Put differently, with cost-based procurement prices, the appropriate fee is a part of the problem of determining a price; but determining an appropriate profit is also a problem in determining the rate of return on investment capital, which is required to make defense

---

*Public Law 413, 80th Congress, 2nd Session, 1948; 10 USC 2304.

**With the exception of architectural and related services, for which the maximum is 6 percent on cost.

production attractive to a sufficient number of producers. The former problem has received great attention from officials ever since the start of World War II. The latter problem is recognized in principle, but has been largely avoided in practice.

In the immediate post-World War II period, Government and industry officials were concerned primarily with establishing the framework for the peacetime procurement system that resulted in and implemented the Armed Services Procurement Act of 1947. Thus, profit policy did not receive great attention. This period was followed by the Korean War and by the establishment of our missile capability. The Government was concerned with expeditious mobilization of the defense industries and, as long as the fees granted assisted this, there was not much inclination to question the customary procedures. The increased demand for military goods and services and the relatively easy budgetary climate caused profit rates to increase rapidly so that defense contractors were not inclined to challenge the procedures. This era of general approval came to an end in the 1960's for two reasons.

One can be perceived by examination on Fig. 1, which shows profits in the aerospace industry -- a sector that provides a major part of the military goods and services. The increasing fees and profits of the early 1950's rapidly declined in the later 1950's, and by 1960 were substantially lower than they had been the previous four or five years. Industry spokesmen, accustomed to the higher profit levels, objected strenuously.

The second reason was an outgrowth of the missile program. Starting in 1962, the McClellan Hearings revealed a number of skeletons in the procurement closet.* Congress became incensed at the high profits earned by some firms, particularly when these resulted from the "profit-pyramiding" that occurred when prime contractors earned a fee

---

*U.S. Congress, Senate, Committee on Government Operations, Permanent Subcommittee on Investigations, Pyramiding of Profits and Costs in the Missile Procurement Programs, U.S. Government Printing Office, Washington, D.C., 1964.

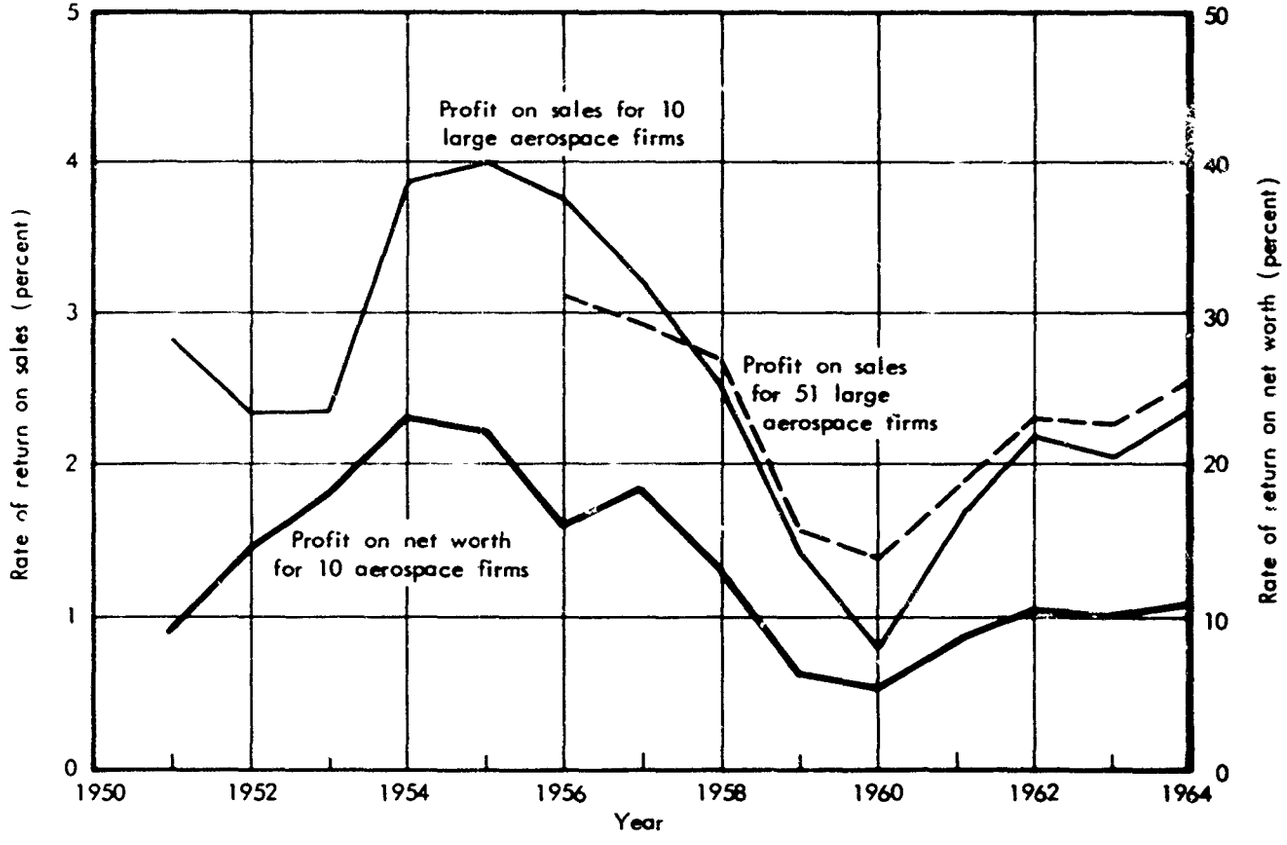

Fig. 1—Rate of return on net worth and sales: 1951-1964

SOURCE: I. N. Fisher and G. R. Hall, Risk and the Aerospace Rate of Return, The RAND Corporation, RM-5440-PR, December 1967, p. 4.

on the costs of subcontracted work. It was clear that if the DOD was not prepared to revise its profit procedures, Congress was prepared to force change.

The result was DOD's introduction of the weighted guidelines profit system in 1964. This is current procedure for determining the percentage to be applied to target costs to yield the target fee. A qualitative procedure is specified that gives more weight to "in-house" activities than to subcontracted costs, thus attacking profit pyramiding. At the same time, the various "factors" specified by the new system have quantitative ranges the designers believed would result in a generally higher profit level.

The WGLS did not, however, change three basic features of the profit system. First, the determination of the appropriate fee rate still remains a "judgmental" matter. While quantitative ranges for the various factors were placed in the regulations to guide contracting officers, these ranges are sufficiently broad to permit considerable discretion at the contracting level in determining the precise target fee. Second, the target fee rate is still based on cost. As mentioned above, the WGLS principally gives more weight to certain types of costs -- principally "in-house" costs for scientific and engineering personnel -- in determining what fee rate the contract will carry.

Third, the WGLS contains no explicit or direct consideration of the investment in plant equipment or working capital required by the contractor to perform the work. There is some implicit or indirect consideration of capital required. For example, a penalty of up to 2 percentage points of fee rate can be assessed against a contractor who uses considerable amounts of Government-furnished facilities. Also, the fee rate is heavily influenced by the nature of the product or service to be furnished, as well as by the type of pricing arrangement (cost-plus-fixed-fee (CPFF), fixed price incentive (FPI), etc.) agreed upon. A relationship exists between these two elements of a contract and contractor capital requirements. However, this correlation is imperfect in that the precise relationship between fees and the contractor's profit requirements is not directly defined by the WGLS. In short, profit policy remains an aspect of contract pricing,

rather than a method of determining the profit level required to retain the productive capabilities which the DOD desires to have available in the defense industries. The essence of the WGLS was to distinguish between various types of costs reimbursed by the cost-based prices for defense goods, and to provide different fee rates for certain types of expenditures.

ISSUE

The responsibility to make sure that rewards are sufficiently high to maintain the availability of a sound defense industry, while at the same time protecting the public purse against unwarranted charges for services rendered, falls on the Department of Defense. The very fact that there exists a large defense sector comprised of the many firms which receive a substantial fraction of their revenues from negotiated defense contracts demonstrates that the resources available for the supply of defense goods and services depend on the fees allowed by the DOD.*

Despite its commitment to assure that needed capability exists, the DOD does not directly control the profits defense contractors earn. The instrument used to insure the financial health of the defense sector is the target fees allowed on negotiated contracts. A firm, of course, is interested in the profit it earns on each sale; yet its overall financial health depends on the sum of the earnings on its negotiated business, advertised defense business, and commercial business. So the DOD must maintain the economic attractiveness of the defense sector although it controls only a part of the industry's sources of revenue and it is required to deal with profit needs on a contract-by-contract basis.

---

*The Armed Services Procurement Regulations (ASPR) contains an extreme statement of this principle, "Effective national defense in a free enterprise economy requires that the best industrial capabilities be attracted to defense contracts. The capabilities will be driven away from the defense market if defense contracts are characterized by low profit opportunities," ASPR, 3-808.1(a).

The DOD's main tool for maintaining the financial attractiveness of the defense sector, and for protecting the taxpayer against profiteering, is its prerogative of adjusting fee rate levels. The last major adjustment of both the level of rates and the differentials between rates came with the introduction of the weighted guidelines profit system in 1964. The history of the WGLS adjustment, therefore, is one of the best sources of information about the impacts of profit policy on contractor earnings.

III. DEFENSE FEES BEFORE AND AFTER THE WEIGHTED GUIDELINES SYSTEM

This section examines fees on negotiated defense contracts and the changes in fees which accompanied the introduction in 1964 of the WGLS. Section IV attempts to link these data to corporate rates of return on investment; but in this section we are concerned with fee rates or profits expressed as a percentage of the price of a defense contract. First, target fee rates are analyzed. Subsequently, the less extensive data on actual fee rates are discussed.

CHANGES IN TARGET FEE RATES

The data source on target fee rates is 10,054 negotiated contracts let by the DOD between fiscal years 1959 and 1967.* These contracts account for about $57 billion of target costs and about $4.8 billion of target fees. Table 1 presents an overview of the sample which is divided four ways: pre- and post-WGL, and two subsamples based on a size criterion.

One question about recent defense profit experience is whether large and small contractors have fared similarly. As it is difficult to set a good criterion of size in defense contracting, a rather simple measure was used to select a group of large firms from the overall sample. All firms on the FY 1967 list of the 100 largest contractors (based on dollar volume) and their subsidiaries were designated Sample A. All other firms were designated Sample B. This somewhat arbitrary procedure captures much of the size phenomena. Note that in the post-1964 period, 120 firms (or 73 firms if principals and their subsidiaries

*The data base consists of negotiated contracts susceptible to cost and profit analysis. (See ASPR XXI, parts 3 and 4). Size of contracts included varies by year. The included sizes are FY 1959-1963, $1,000,000 or more plus a random sample down to $10,000; FY 1964-1965, $500,000 or more plus a random sample down to $10,000; FY 1966, $500,000 or more; FY 1967-1968, $200,000 or more. For FY 1967-1968 the amounts represent total negotiated figures; earlier data are only the negotiated amounts actually obligated. The data are maintained by the Assistant Secretary of Defense (Comptroller), Directorate for Statistical Services and periodically summarized in a series entitled, Profit Rates on Negotiated Prime Contracts.

Table 1

TARGET FEES ON NEGOTIATED DOD CONTRACTS, PRE-AND POST-WGL[a]
(In $ million)

Variable	Weighted Guidelines		
	Pre-	Post-	Total
Target fee rate			
Sample A	.077	.097	.085
Sample B	.082	.091	.086
Total	.078	.096	.085
Number of contracts			
Sample A	2,701	4,409	7,110
Sample B	1,319	1,625	2,944
Total	4,020	6,034	10,054
Target cost			
Sample A	31,844	20,092	51,936
Sample B	3,127	2,283	5,410
Total	34,971	22,375	57,346
Target fee			
Sample A	2,456	1,939	4,395
Sample B	256	208	464
Total	2,712	2,147	4,859
Number of firms			
Sample A[b]	104(74)	120(73)	
Sample B	563	632	
Total	667	752	

[a]Totals and average profit rates for pre- and post-WGL periods differ slightly from those shown in Profit Rates on Military Prime Contracts because the DOD puts all FY 1967 data in the post-WGL period. For this study all contracts before January 1964 are included in the pre-WGL period.

[b]Number of consolidated companies shown in parentheses.

are consolidated) accounted for $20 billion of the $22 billion in target cost. Sample B, with 632 firms, accounted for only $2 billion, or about 10 percent. Note that in the pre-WGLS period Sample B had, on average, half a percentage point higher fee rate. In the post-WGLS period the relationship was reversed. Sample A had a 0.6 of a percentage point higher target fee rate. Both samples, however, showed an increase in the average target fee.

This calculation does not answer questions about individual firm experiences. To deal with these, the average contract "portfolio" target fee rate for each contractor in each period was computed. "Portfolio" in this context refers to the set of contracts held by a contractor at any given time. This set of potentials for earning profits may be thought of as analogous to the portfolio of securities held by a financial investor. For each contractor, target fees and target costs for all contracts were summed and the mean target fee rate calculated. Thus, each fee was weighted by the target cost involved. There was no such weighting among contractors, however; a small firm's average fee rate is as significant as the average fee rate of a large firm in analyzing the profit experience of different firms. No distinction was made between firms with a substantial percentage of their business in negotiated sales and those with small amounts, except as this is reflected in the assignment of the firm to either Sample A or Sample B.

Samples A' and B' consist of firms in Samples A and B that had contracts in both periods. Having computed average portfolio target fee rates for Samples A' and B', the firms with contracts in both periods, the changes between the two periods can be examined. Table 2 shows the result.

Note that the scale in Table 2 is in percentage points. Thus, a decline of, say, 1.3 means that the firm had a fee rate in the pre-1964 period of 11.3 and in the later period a target fee rate average of 10.0 or 9.9 to 8.6, or any equivalent. About 66 percent of the firms in Sample A' made gains, as did about 75 percent of the firms in Sample B'. Most firms did better after 1964. Note that more Sample B firms than Sample A firms showed significant declines. There also were slightly more B firms with substantial gains.

Table 2

PERCENTAGE TARGET FEE RATE CHANGES,
PRE- AND POST-WEIGHTED GUIDELINES

Changes (Percentage Points)	No. of Firms		Percentage		Cumulative Percentage	
	Sample A'	Sample B'	Sample A'	Sample B'	Sample A'	Sample B'
-4.1 and over	0	5	0	2.0	0	2.0
-3.1 to -4.0	1	2	1.5	.8	1.5	2.8
-2.1 to -3.0	1	8	1.5	3.3	3.0	6.1
-1.7 to -2.0	2	6	2.9	2.5	5.9	8.6
-1.3 to -1.6	1	3	1.4	1.2	7.3	9.8
-0.9 to -1.2	0	7	0	2.9	7.3	12.7
-0.7 to -0.8	0	9	0	3.7	7.3	16.4
-0.5 to -0.6	2	3	2.9	1.2	10.2	17.6
-0.3 to -0.4	2	4	2.9	1.6	13.1	19.2
-0.1 to -0.2	6	9	8.7	3.7	21.8	22.9
0	3	4	4.3	1.6	26.1	24.5
+0.1 to 0.2	5	12	7.2	4.9	33.3	29.4
+0.3 to 0.4	4	12	5.8	4.9	39.1	34.4
+0.5 to 0.6	4	11	5.8	4.5	44.9	38.8
+0.7 to 0.8	2	7	2.9	2.9	47.8	41.7
+0.9 to 1.0	3	14	4.3	5.8	52.1	47.5
+1.1 to 1.2	1	12	1.5	4.9	53.6	52.4
+1.3 to 1.4	1	16	1.5	6.6	55.1	59.0
+1.5 to 1.6	4	6	5.8	2.5	60.9	61.5
+1.7 to 1.8	2	5	2.9	2.1	63.8	63.6
+1.9 to 2.0	1	6	1.5	2.5	65.3	66.1
+2.1 to 3.0	11	37	15.9	15.2	81.2	81.3
+3.1 to 4.0	8	18	11.6	7.4	92.8	88.7
+4.1 and over	5	27	7.2	11.1	100.0	100.0
Total	69	243	100.0	100.0		

NOTE: Detail may not add to total due to rounding.

To take a closer look at what happened, the portfolio target fee rates of the firms in Samples A and B were computed. The rates are shown in Table 3. On average, target fee percentage rates increased for both groups. In the pre-WGLS period, the modal groups were 7.5 to 8.0 and 4.0 and 6.0, respectively. After 1964, the modal groups were 9.5 to 10.0 for both categories.

The dispersion of the target fee distributions is an important consideration, because one of the apparent objectives sought through implementation of the WGLS was to increase the range of profit opportunities in the defense sector. Using variance as a measure of dispersion, the following results are obtained. In the pre-WGLS period, the variance for Sample A was 16.4 and for Sample B, 14.5. After introduction of WGLS, the variance of Sample A increased to 28.6 and decreased for Sample B to 10.9. These results imply that the WGLS did have the results of increasing the spread of profit rates for the smaller firms but not, apparently, for the larger firms.

The distributions of target fees can be seen by plotting the cumulative percentages, as shown in Fig. 2. Note that in the pre-WGLS period, the B sample (the heavy black line) was disturbed very much like the A sample (the light line), up to about 7 percent, where the two curves crossed. Beyond that point, the B sample was more skewed to the right. After WGLS, the A curve shifted more than the B curve. Note the difference between the two dashed lines. The relationship between the two distributions was also changed. Now up to about 10 percent, the A firms did better than the B firms. Beyond that figure the two distributions were about the same until the extremes were reached. More B firms were at the very high fee rate end of the distribution. In short, while both samples saw a fee rate increase throughout the entire distribution of firm experiences, Sample A, the large firm sample, had a much more substantial gain, particularly at the lower end of the distribution.

If we look at target cost rather than the number of firms, as in Table 4, the pattern is more complex. The upward shift is quite impressive. For Sample A, the pre-WGLS modal class was 7.5 to 8 percent with $8.0 billion. In the post-WGLS period the modal class is

Table 3

DISTRIBUTION OF FIRMS BY TARGET FEE RATE

Firm Fee Rate	Number of Firms				Percentage				Cumulative Percentage			
	Pre-WGL		Post-WGL		Pre-WGL		Post-WGL		Pre-WGL		Post-WGL	
	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B
0 > 4.0	6	22	1	13	5.8	3.9	0.8	2.0	5.8	3.9	0.8	2.0
4.0 > 6.0	10	84	1	40	9.6	14.9	0.8	6.3	15.4	18.8	1.6	8.3
6.0 > 6.5	8	37	5	18	7.7	6.6	4.2	2.8	23.1	25.4	5.6	11.1
6.5 > 7.0	9	65	4	32	8.6	11.5	3.3	5.1	31.7	36.9	9.1	16.2
7.0 > 7.5	5	44	5	34	4.8	7.8	4.2	5.4	36.5	44.7	13.3	21.6
7.5 > 8.0	15	39	4	51	14.4	6.9	3.3	8.1	50.9	51.6	16.6	29.7
8.0 > 8.5	12	25	8	44	11.5	4.4	6.7	7.0	62.4	56.0	23.3	36.7
8.5 > 9.0	12	30	9	57	11.5	5.3	7.5	9.0	73.9	61.3	30.8	45.7
9.0 > 9.5	5	33	19	55	4.8	5.9	15.8	8.7	78.7	67.2	46.6	54.4
9.5 >10.0	7	47	22	87	6.7	8.3	18.3	13.8	85.4	75.5	67.9	68.2
10.0 >10.5	6	68	19	72	5.8	12.1	15.8	11.4	91.2	87.6	80.7	79.6
10.5 >11.0	5	24	7	34	4.8	4.3	5.8	5.4	96.0	91.9	86.5	85.0
11.0 >11.5	3	17	4	36	2.9	3.0	3.3	5.7	98.9	94.9	89.8	90.7
11.5 >12.0	1	8	4	22	1.0	1.4	3.3	3.5	100.0	96.3	93.1	94.2
12.0 >15.0	--	16	7	33	--	2.8	5.8	5.2	100.0	99.1	98.9	99.4
15.0 and over	--	4	1	4	--	0.7	0.8	0.6	100.0	100.0	100.0	100.0
Total	104	563	120	632	100.0	100.0	100.0	100.0				

NOTE: Detail may not add to total due to rounding.

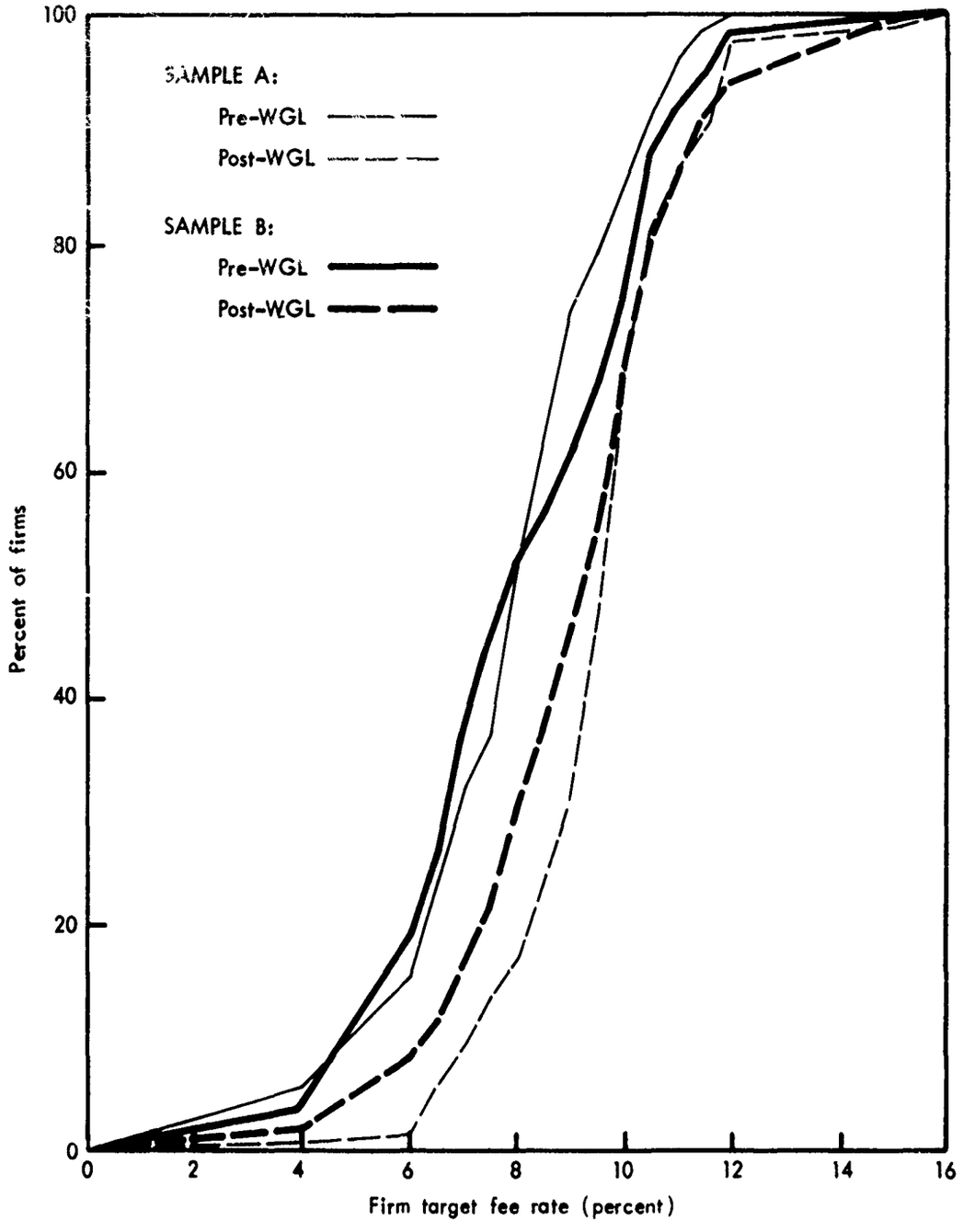

Fig. 2 -- Cumulative distribution of firms by target fee rate

Table 4

DISTRIBUTION OF TARGET COST BY FIRM TARGET FEE RATES, SAMPLES AND PERIODS
(In $ million and Percent)

Firm Fee Rate	Cost						Percentage					
	Pre-WGL			Post-WGL			Pre-WGL			Post-WGL		
	Sample A	Sample B	Both	Sample A	Sample B	Both	Sample A	Sample B	Both	Sample A	Sample B	Both
0 > 4.0	194	112	306	98	77	175	0.6	3.6	0.9	0.5	3.4	0.8
4.0 > 6.0	768	249	1017	114	146	260	2.4	8.0	2.9	0.6	6.4	1.2
6.0 > 6.5	1472	144	1616	--	24	24	4.6	4.6	4.6	--	1.1	0.1
6.5 > 7.0	6690	128	6818	1201	94	1295	21.0	4.1	19.5	6.0	4.1	5.8
7.0 > 7.5	1829	438	2267	61	101	162	5.3	14.0	6.5	0.3	4.4	0.7
7.5 > 8.0	7965	336	8301	39	61	100	25.8	10.7	23.7	0.2	2.7	0.4
8.0 > 8.5	5545	223	5768	1142	155	1297	17.4	7.1	16.5	5.7	6.8	5.8
8.5 > 9.0	5267	407	5674	579	378	957	16.6	13.0	16.2	2.9	16.6	4.3
9.0 > 9.5	495	262	757	6830	282	7112	1.6	8.4	2.2	34.0	12.3	31.8
9.5 >10.0	1063	557	1620	4492	209	4701	3.3	17.8	4.6	22.3	9.1	21.0
10.0 >10.5	479	78	557	1346	206	1552	1.5	2.5	1.6	6.7	9.0	6.9
10.5 >11.0	71	73	144	454	169	623	0.2	2.3	0.4	2.3	7.4	2.8
11.0 >11.5	3	26	29	248	130	378	*	0.8	0.1	1.2	5.7	1.7
11.5 >12.0	4	49	53	2619	105	2724	*	1.6	0.2	13.0	4.6	12.2
12.0 >15.0	--	42	42	863	143	1006	--	1.4	0.1	4.3	6.3	4.5
15.0 and over	--	3	3	6	3	9	--	0.1	*	*	0.1	*
Total	31,845	3,127	34,972	20,092	2,283	22,375	100.0	100.0	100.0	100.0	100.0	100.0

*Less than 0.05 percent.

9 to 9.5 percent, with $6.8 billion. The shift for the Sample B firms is somewhat less spectacular and somewhat more evenly distributed. The pre-WGLS distribution is multimodal, with peaks at 7.0 to 7.5 percent and at 9.5 and 10.0. The post-WGLS distribution peaks are at 8.5 to 9.0; but all classes up to 10.5 were well represented.

Again, it is easier to deal with the dispersion of target fee rates on a cumulative percentage basis, as in Table 5. In the pre-WGLS period, Sample B had more target cost in portfolios with very low target fee rates than did Sample A. Sample B also had more of its target costs in portfolios above 9.5 percent. The A distribution, however, had a higher variance: 71.0 compared to Sample B's variance of 26.5.

After the introduction of WGLS, the relationship between the A and B distributions changed. In the pre-1964 period, 93.4 percent of the Sample A target cost was in portfolios with an average target fee rate of less than 9 percent. Sample B had only 65 percent of its target cost in this category. After 1964 the relationship reversed. Sample A only had 16 percent of the total target cost in portfolios with an average rate less than 9 percent. Sample B, however, had 45.5 percent in that category. These figures are shown graphically in Fig. 3. The variance of Sample B (68.0) increased much more than the variance of Sample A (84.7).

In summary, most firms had higher target fee rates after the introduction of the WGLS. However, a sizable number, about one fourth of each sample, had no change in their average fee rate or experienced a decline in fee rate. Overall, the large firms as a group generally improved their average target fees more than did the smaller firms. However, there were more small firms at both the extremes of any profit distribution than there were in the distribution of the Sample A firms. The variance of firms by target fee rates increased for Sample A but decreased for Sample B. On the other hand, if cost, rather than number of firms, is used as the measure, Sample B's variance increased substantially on balance. It seems fair to say that the WGLS resulted in spreading the distribution of target fee rates in the defense sector.

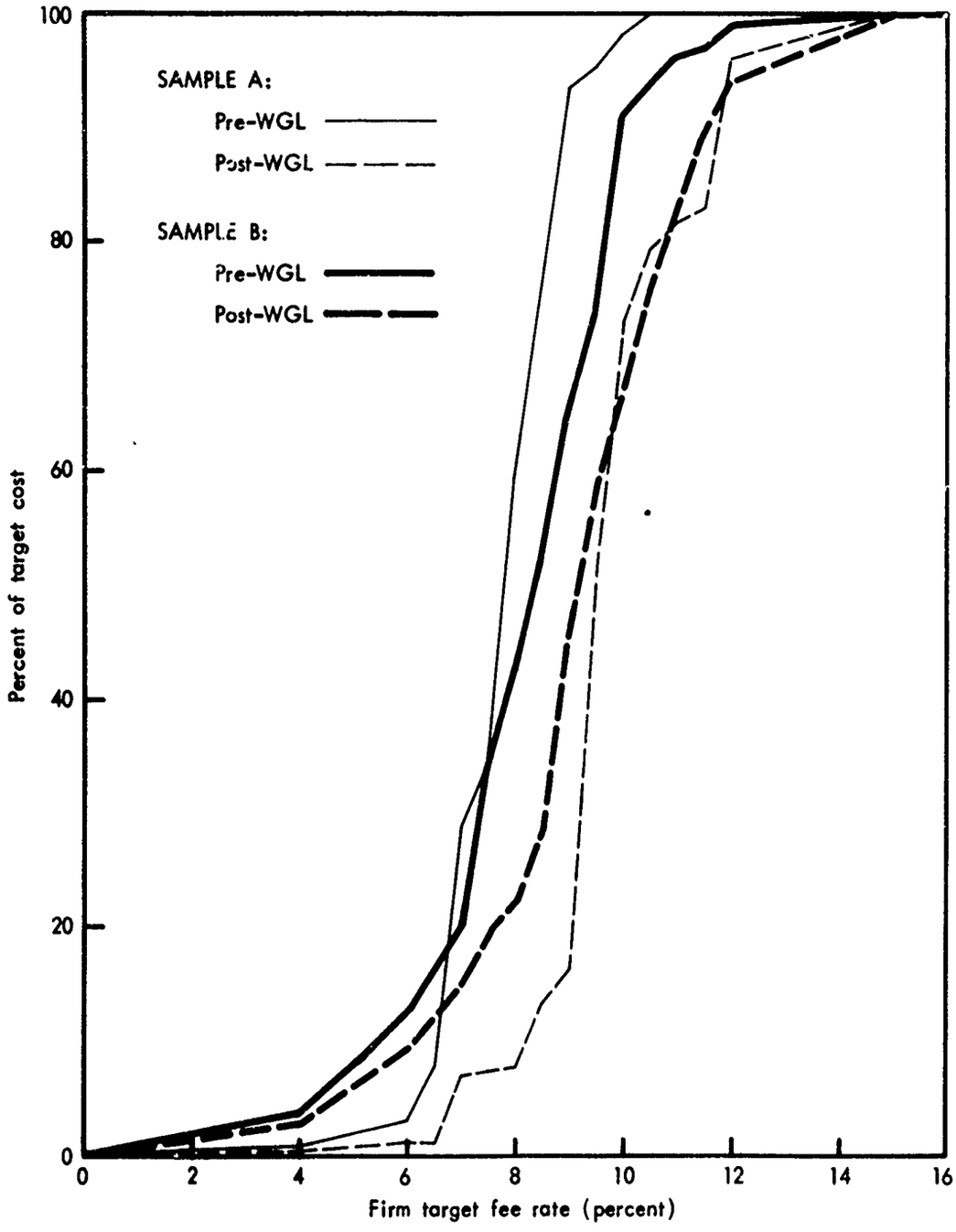

Fig. 3 -- Cumulative distribution of target cost by target fee rate

Table 5

DISTRIBUTION OF TARGET COST DIVIDED BY FEE RATES, SAMPLES AND PERIOD: CUMULATIVE PERCENTAGE

Firm Fee Rate	Pre-WGL			Post-WGL			Both Periods		
	Sample A	Sample B	Both	Sample A	Sample B	Both	Sample A	Sample B	Both
0 > 4.0	0.6	3.6	0.9	1.5	3.4	0.8	0.6	3.5	0.8
4.0 > 6.0	3.0	11.6	3.8	1.1	9.8	2.0	2.3	10.8	3.0
6.0 > 6.5	7.6	16.2	8.4	1.1	10.9	2.1	5.1	13.9	5.9
6.5 > 7.0	28.6	20.3	27.9	7.1	15.0	7.9	20.3	18.0	20.1
7.0 > 7.5	34.4	34.3	34.4	7.4	19.4	8.6	23.9	28.0	24.3
7.5 > 8.0	59.4	45.0	58.1	7.6	22.1	9.0	39.3	35.3	39.0
8.0 > 8.5	76.8	52.1	74.6	13.3	28.9	14.8	52.2	42.3	51.3
8.5 > 9.0	93.4	65.1	90.8	16.2	45.5	19.1	63.5	56.8	62.9
9.0 > 9.5	95.0	73.5	93.0	50.2	57.8	50.9	77.6	66.9	76.6
9.5 >10.0	98.3	91.3	97.6	72.5	66.9	71.9	88.3	81.1	87.6
10.0 >10.5	99.8	93.8	99.2	79.2	75.9	78.8	91.8	86.3	91.3
10.5 >11.0	100.0	96.1	99.6	81.5	83.3	81.6	92.8	90.8	92.6
11.0 >11.5	100.0	96.9	99.7	82.7	89.0	83.3	93.3	93.7	93.3
11.5 >12.0	100.0	98.5	99.9	95.7	93.6	95.5	98.3	96.5	98.2
12.0 >15.0	100.0	99.9	100.0	100.0	99.9	100.0	100.0	99.9	100.0
15.0 and over	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

IMPACTS OF THE WGLS ON FEE RATES

The important question is not what happened to defense target fee rates during the last few years, but why the changes occurred. The difficulty is that the fee rates the DOD pays may change for a variety of reasons. Particularly important reasons are changes in the types of goods and services purchased, changes in the use of different contract-types, and changes in profit policy. The DOD typically pays different fee rates for different types of goods and services. This practice reflects a view that entrepreneurial compensation must be higher in some activities than in others to reflect differences in skill requirements, risks, or management and technical inputs. Thus, a change in the product composition of defense procurement implies a change in the average defense fee rate.

Different types of contracts carry different fee rates because the contractor assumes greater risks under some contract types than under others. Consequently, a change in the mixture of different contract types used for defense procurement also implies a change in the average fee rate.

Finally, there can be a change simply because the Government decides that a different level of profits is required to fulfill either its commitment to maintain healthy defense industries, or its responsibility to prevent "profiteering."

All three changes are independent; so an increase in fee levels stemming from a change in one variable might be offset by a change in another variable. On the other hand, the factors might reinforce each other. The task is to try to partition the observed changes among these three variables. This can be done by using an index-number approach. Tables 6 and 7 divide procurements from each sample by contract type and classes of goods and services.* Note the considerable differences among average fee rates for different types of contracts and

*The goods and services classes were obtained from the budget claimant code programs. Airframes consists of class A1A; Aircraft Engines, A1B; Missiles and Space, A-2; Ships, A-3; Vehicles, A-4A and A-4B; Weapons, A-5; Ammunition, A-6; Electronics, A-7; Services, S-1; Miscellaneous, all others.

Table 6

AVERAGE TARGET FEE RATES, PRE- AND POST-WEIGHTED GUIDELINES SYSTEM: BY PROGRAM AND CONTRACT TYPE--SAMPLE A

(In percentage points)

Goods and Services Procured	FFP[a]		FPI		FPE		FPR		CPIF		CPFF	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
R&D Contracts												
Airframes	9.0	7.2	8.4	8.7	dna	dna	9.0	--	5.1	7.7	5.8	6.6
Aircraft engines	11.4	6.7	10.2	8.7	dna	dna	7.9	--	5.6	7.6	6.7	7.3
Missile & space	9.5	9.8	9.0	10.1	dna	dna	7.5	6.2	6.3	7.5	6.1	8.0
Ships	6.5	11.0	7.5	9.0	dna	dna	--	--	7.1	9.7	4.3	2.7
Vehicles	611	--	--	7.5	dna	dna	9.3	--	--	9.6	8.3	6.5
Weapons	9.9	12.2	--	--	dna	dna	--	--	--	8.8	6.2	8.4
Ammunition	20.0	11.0	--	11.7	dna	dna	--	--	8.0	8.8	6.3	8.3
Electronics	9.1	8.9	9.2	--	dna	dna	10.4	8.5	5.7	8.2	6.0	7.9
Service	--	9.9	--	9.9	dna	dna	--	7.9	--	2.3	--	7.0
Miscellaneous	6.5	10.6	8.8	8.8	dna	dna	7.4	--	7.4	9.3	4.3	8.6
Non-R&D Contracts												
Airframes	11.0	12.4	8.4	9.7	--	--	8.6	12.7	6.2	7.9	6.2	6.7
Aircraft engine	10.5	10.4	9.8	5.9	--	--	9.9	10.3	8.1	7.9	6.0	7.0
Missile & space	9.8	10.8	9.3	9.4	--	--	8.7	10.9	6.4	7.7	6.7	8.1
Ships	9.6	10.9	9.0	9.5	9.3	12.9	11.3	--	6.3	8.1	6.2	3.7
Vehicles	7.6	8.6	9.4	9.3	--	--	8.3	--	6.5	7.9	6.9	7.9
Weapons	10.0	10.3	8.9	9.3	--	--	10.3	11.1	6.9	8.2	--	8.3
Ammunition	8.7	11.4	9.1	9.7	--	9.6	9.1	--	7.0	6.7	5.5	6.1
Electronics	9.4	11.3	9.9	10.3	--	12.2	10.2	10.7	7.4	8.1	6.4	7.9
Service	--	9.9	--	8.0	--	--	--	9.6	--	--	--	8.4
Miscellaneous	9.2	9.9	9.8	9.4	--	--	10.1	--	--	7.4	--	--

[a]Reading across, the contracts are FFP (firm fixed price), FPI (fixed price incentive), FPE (fixed price escalation), FPR (fixed price redetermination), CPIF (cost plus incentive fee), CPFF (cost plus fixed fee).

Table 7

AVERAGE TARGET FEE RATES, PRE- AND POST-WEIGHTED GUIDELINES SYSTEM: BY PROGRAM AND CONTRACT TYPE--SAMPLE B
(In percentage points)

Goods and Services Procured	FFP[a]		FPI		FPE		FPR		CPIF		CPFF	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
R&D Contracts												
Airframes	7.7	9.5	9.9	--	dna	dna	11.1	--	5.3	6.7	5.8	7.8
Aircraft engines	6.0	3.8	--	--	dna	dna	--	--	6.7	8.9	6.5	8.2
Missile & space	9.9	10.3	9.9	9.9	dna	dna	--	--	8.0	6.2	7.7	7.6
Ships	7.7	9.8	10.5	--	dna	dna	11.9	--	5.8	8.5	5.9	5.1
Vehicles	--	--	--	8.7	dna	dna	8.8	--	--	7.0	6.4	9.6
Weapons	10.6	11.3	--	9.9	dna	dna	--	--	8.5	9.3	5.6	8.6
Ammunition	--	7.2	10.0	10.3	dna	dna	9.6	--	--	7.0	6.8	8.0
Electronics	10.0	8.1	8.0	9.4	dna	dna	9.4	--	7.4	7.8	6.1	6.0
Service	--	8.2	--	10.0	dna	dna	--	--	--	3.3	--	7.4
Miscellaneous	7.3	13.5	--	--	dna	dna	10.1	--	6.6	6.9	5.9	8.5
Non-R&D Contracts												
Airframes	9.8	10.2	8.5	10.4	--	--	7.8	--	6.4	5.9	6.6	5.6
Aircraft engines	8.7	9.6	--	8.7	--	--	10.0	--	6.6	--	5.8	--
Missile & space	9.1	10.1	9.1	9.8	--	--	8.4	--	6.1	7.8	6.5	8.1
Ships	9.0	10.6	--	9.9	11.3	--	11.2	--	--	5.9	7.0	7.0
Vehicles	8.8	8.7	9.4	--	6.4	--	7.8	--	--	7.0	6.7	7.0
Weapons	9.5	10.7	10.4	7.9	--	--	7.9	--	--	--	--	8.4
Ammunition	9.2	9.3	8.9	10.6	9.3	6.9	10.4	--	6.6	7.2	6.7	6.4
Electronics	9.8	10.7	9.5	9.6	--	10.0	10.0	11.1	4.1	7.3	5.4	7.9
Service	--	7.2	--	--	--	--	--	--	--	5.6	--	7.5
Miscellaneous	7.1	9.7	8.7	8.6	--	--	--	9.7	2.9	--	11.1	--

[a]Reading across, the contracts are FFP (firm-fixed price), FPI (fixed price incentive), FPE (fixed price escalation), FPR (fixed-price redetermination), CPIF (cost plus incentive fee), CPFF (cost plus fixed fee).

products. Also note the changes between the two periods. In general, there seems to have been an upward trend in target fee rates; but this is not uniform. Some types of procurement showed decreases in fee rates. Also, the total procurement dollars represented by each type of procurement differs with important shifts between the two periods.

Considering all these factors, an overall assessment of the impact of the WGLS can be obtained in the following way. The target fees for all contracts during some period can be defined as

$$(1) \quad \text{Total Target Fee} = \sum_{i=1}^{10} \sum_{j=1}^{6} (\pi_T C_T)_{ij}$$

where π_T stands for the target fee rate in some period, C_T for the target cost, i for the i^{th} class of goods and services, and j for the j^{th} class of contract. If we then take the target costs in one period and apply the average target fee rates in another period, we can generate hypothetical total target fees. That is, rather than observe the change in target fee rates, as shown in Tables 6 and 7, we can examine the change in the dollar amounts of the target fees. Specifically, consider equations (2) and (3):

$$(2) \quad \text{Total Hypothetical Target Fees} = \sum_{i=1}^{10} \sum_{j=1}^{6} (\pi_2 C_{T_1})_{ij}$$

$$(3) \quad \text{Total Hypothetical Target Fees} = \sum_{i=1}^{10} \sum_{j=1}^{6} (\pi_1 C_{T_2})_{ij}$$

The numerical subscripts refer to periods. In this case, let period 1 be the pre-guidelines period and period 2 be the post-guidelines period.

Equation 2 estimates hypothetical target fees for the pre-WGLS period by computing what the pre-WGLS target fees would have been had the post-WGLS profit rates applied in that period. Equation (3), in contrast, estimates hypothetical fees for the post-WGLS period by

using the post-WGLS distribution of target cost by program and type of contract, but using the pre-WGLS average rates. For Eq. (2), the assumption is that if the WGLS had been instituted in 1959 instead of 1964, the period 1959 to 1963 would have seen average target fee rates for each class of procurement and type of contract the same as the average rates observed in the post-1964 period. Equation (3), on the other hand, assumes that if the WGLS had not been implemented in 1964, the average target fee rates observed from 1959 through 1964 would have continued until 1968.

The impact of the introduction of the WGLS can be estimated by taking the target fees that were actually paid and subtracting the hypothetical fees. Each equation represents a separate way of estimating the impact of the WGLS. The two equations probably bracket some "true" impact of the WGLS; but comparison of the two computations should permit a reasonable assessment of how much difference the system has made to target fees, and where the impacts have been felt.

Table 8 presents the two computations for Sample A, and Table 9 represents the computations for Sample B. The numbers are in millions of dollars and represent, for each type of contract awarded within the 10 program-groups, the difference between the actual target fee and hypothetical target fee. A minus sign indicates that the hypothetical target fee was less than the actual target fee. A glance at Table 8 shows relatively few minus signs in the first half of the table. Thus, the contractor's fees would have been larger for most categories if the post-WGLS rates had applied. To illustrate, consider CPFF contracts for R&D work in the electronics program. Had the post-WGLS average target fee rate been in effect, contractors would have been allowed almost $31 million more in target fees.

A minus sign in the bottom half of the table indicates that the WGLS increased target fees. The hypothetical fee in this part of the table is computed by using the average target fee rates from the pre-WGLS period. A minus sign indicates that if the prior rates had continued, the target fees negotiated for any given category would have been less than the target fees actually allowed. To illustrate, in Table 8 consider FFP contracts for non-R&D work in the airframes

Table 8

DIFFERENCES BETWEEN ACTUAL AND HYPOTHETICAL TARGET FEES: SAMPLE A
(In $ million)[a]

Goods and Services	R&D Contracts						Non-R&D Contracts					
	FFP	FPI	FPR	CPIF	CPFF	Total	FFP	FPI	FPR	CPIF	CPFF	Total
Actual Target Fees minus Hypothetical Target Fees $(\pi_1 C_{T_1})-(\pi_2 C_{T_1})$												
Airframes	-2.8	0.3	--	18.6	5.6	21.7	14.0	-74.3	14.9	3.6	2.2	109.0
Aircraft engines	-2.6	0.0	--	1.2	3.1	1.7	0.0	21.8	1.6	0.1	0.3	- 20.0
Missile & space	0.1	0.0	-0.1	18.0	64.4	82.4	1.9	2.6	11.5	22.4	19.3	57.7
Ships[b]	4.7	0.5	--	0.4	7.7	- 2.1	0.7	0.1	--	0.9	4.7	- 2.4
Vehicles	--	--	--	---	0.9	- 0.9	1.5	0.1	--	0.0	--	- 1.4
Weapons	0.0	--	--	--	0.2	0.2	0.2	0.1	0.8	0.0	--	0.7
Ammunition	-1.9	--	--	0.0	0.4	- 1.5	0.8	0.1	--	0.0	0.8	1.7
Electronics	-0.2	0.4	-1.3	4.4	27.6	30.9	9.4	3.3	3.4	0.6	- 5.4	22.1
Service	--	--	--	--	--	--	--	--	--	--	--	--
Miscellaneous	--	0.1	--	0.1	3.4	3.6	- 0.2	--	--	--	--	0.2
Total	-2.7	1.3	-1.4	42.7	96.1	136.0	-28.7	-58.6	32.2	27.4	23.3	170.2
Actual Target Fees minus Hypothetical Target Fees $(\pi_2 C_{T_2})-(\pi_1 C_{T_2})$												
Airframes	0.8	- 0.1	--	- 2.2	- 0.3	- 3.4	-47.9	-32.2	- 1.0	- 1.1	- 0.3	- 82.5
Aircraft engines	4.0	0.1	--	- 0.3	- 0.3	- 4.5	0.0	9.1	- 4.5	0.1	- 1.3	3.4
Missile & space	-0.9	-13.6	--	-25.0	-10.1	-49.5	- 6.5	- 3.2	- 0.2	- 5.4	- 2.3	- 17.6
Ships	-0.6	--	--	- 0.6	1.8	0.6	- 1.1	- 0.1	--	- 1.5	6.9	4.2
Vehicles	--	--	--	--	0.6	0.6	- 3.6	0.0	--	- 0.1	- 0.8	- 4.5
Weapons	-0.3	--	--	--	0.0	- 0.3	- 0.5	- 0.4	--	- 0.2	--	- 1.1
Ammunition	0.2	--	--	- 0.4	- 0.7	- 0.9	- 5.6	- 1.8	--	0.2	0.0	- 7.2
Electonics	0.1	- 0.7	--	- 5.3	3.3	- 9.4	-16.5	- 3.2	0.0	- 1.3	- 1.5	- 22.5
Service	--	--	--	--	--	--	--	--	--	--	--	--
Miscellaneous	0.0	- 0.1	--	- 0.1	- 0.9	- 1.1	- 1.0	0.2	--	--	--	- 0.8
Total	3.4	14.4	--	-33.9	-1.32	-64.9	-82.7	-31.6	- 5.7	- 9.3	0.7	-128.6

[a] A minus sign indicates that the hypothetical fee computed by using the average profit rates from the other period was less than the actual fee. A dash indicates either no target cost in that category or no average fee rate from the other period.

[b] In the ship program, there were fixed price escalation contracts that would have yielded 0.5 difference in fee had post- WGL rates been applied in the pre- WGL period.

program. Had the pre-WGLS target fee rates rather than the post-WGLS target fee rates been applied, the target fees allowed for this class of procurements would have been almost $48 million less than the fees actually allowed.

Inspection of the signs and magnitudes indicates that the introduction of the WGLS resulted in -- or at least accompanied -- an increase in target fee rates. We have long known that if defense procurement is examined as a whole, or by type of contract, target fee rates increased after 1964. The difficulty is that such increases might have resulted either from an increase in average fee rates, or from a shift in the composition of defense procurement to products which typically carry high target fees from products that carry low fees. Because they divide procurement by program as well as product, Tables 8 and 9 permit the conclusion that the increase in target fees was not merely due to a shift in procurements, since most cells showed higher fees using post- rather than pre-WGLS rates. Even so, it is instructive to note that different classes were affected differently; and a number of categories saw fees move counter to the general trend.

Because of this variability in impact, it is hard to get a summary impression from Tables 8 and 9. Table 10 attempts such an estimate. In Table 10, lines 1, 2, 3, and 4 (with different signs) merely repeat the totals from Tables 8 and 9. The numbers in lines 1 and 2 can be interpreted as the dollar amount by which the target fees actually negotiated with contractors during the period 1959-1963 would have been increased had the WCLS been in effect. Lines 4 and 5 can be interpreted as the dollar amount by which contractors' target fees in the period 1964-1968 were increased as a result of introduction of the WGLS. To give some idea of the relative importance of these totals, line 3 expresses the total of lines 1 and 2 as a percentage of the actual target fees negotiated in the pre-WGLS period. (The totals of the actual target fees were contained in Table 1.) Line 6 takes the differences between the actual target rates negotiated and the hypothetical rates, using the period WGLS averages, and expresses these as percentages of the actual target fees negotiated in the 1964-1968 period. After examining all the computations, it seems reasonable to

Table 9

DIFFERENCES BETWEEN ACTUAL AND HYPOTHETICAL TARGET FEES: SAMPLE B
(In $ million)[a]

Goods and Services	R&D Contracts					Non-R&D Contracts				
	FFP	FPI	CPIF	CPFF	Total	FFP	FPI	CPIF	CPFF	Total
Actual Target Fees minus Hypothetical Target Fees $(\pi_1 C_{T_1})-(\pi_2 C_{T_1})$										
Airframes	1.1	--	0.3	0.4	1.8	0.3	2.6	-0.1	-0.1	2.7
Aircraft engines	-1.0	--	0.0	0.9	-0.1	0.2	--	--	--	0.2
Missile & space	0.0	0.0	-0.3	-0.8	-1.1	0.4	0.4	0.9	0.8	2.5
Ships	0.0	--	0.1	-0.2	-0.1	0.9	--	--	-0.2	0.7
Vehicles	--	--	--	0.2	0.2	0.0	--	--	--	--
Weapons	--	--	0.1	0.9	1.0	0.4	-1.0	--	--	-0.6
Ammunition	--	0.0	--	0.2	0.2	0.1	0.1	0.2	-0.1	0.3
Electonics[b]	-0.5	0.4	0.0	-0.3	-0.4	2.1	0.1	3.0	1.7	6.9
Service	--	--	--	--	--	--	--	--	--	--
Miscellaneous	0.4	--	0.0	0.7	1.1	1.1	0.0	--	--	1.1
Total	0.0	0.4	0.2	2.0	2.6	5.5	2.2	4.0	2.1	13.8
Actual Target Fees minus Hypothetical Target Fees $(\pi_2 C_{T_2})-(\pi_1 C_{T_2})$										
Airframes	-0.2	--	0.0	-0.1	-0.3	-1.0	-0.6	0.0	0.0	-1.6
Aircraft engines	0.1	--	-0.1	-0.2	-0.2	-0.2	--	--	--	-0.2
Missile & space	-0.1	0.0	1.0	0.0	0.9	-0.8	-0.3	-0.5	-1.1	-2.7
Ships	-0.1	--	-0.1	--	-0.2	-0.7	--	--	0.0	-0.7
Vehicles	--	--	--	--	--	0.0	--	--	-0.1	-0.1
Weapons	0.0	--	-0.1	-0.5	-0.6	-1.3	0.0	--	--	-1.3
Ammunition	--	0.0	--	-0.1	-0.1	-0.4	-1.5	-0.1	0.0	-2.0
Electronics	0.4	-0.7	-0.1	0.1	-0.3	-2.4	-0.1	-0.3	-0.3	-3.1
Service	--	--	--	--	--	--	--	--	--	--
Miscellaneous	--	--	0.0	-0.2	-0.2	-4.0	0.0	--	--	-4.0
Total	0.1	-0.7	0.6	-1.0	-1.0	-10.8	-2.5	-0.9	-1.5	-15.7

[a]See Footnote a, Table 8.

[b]In the electronics program there were fixed price redetermination contracts that would have yielded 1.9 difference in fee had post- WGL rates been applied in the pre-WGL period. Likewise, in the ammunition program there were fixed price escalation contracts that would have yielded 0.1 less fee using pre- WGL costs and 1.8 more fee using post- WGL costs and 1.8 more fee in the post- WGL period using pre- WGL rates.

Table 10

SUMMARY OF FEE INCREASE COMPUTATION
(In $ million)

Type	Sample A	Sample B	Total
Actual Target Fees minus Hypothetical Target Fees $(\pi_1 C_{T_1})-(\pi_2 C_{T_1})$			
1. Research and development	136.0	2.6	138.6
2. Non-research and development	170.2	13.8	184.0
Total	306.2	26.4	322.6
3. Percentage of actual target fees $\frac{(\pi_1 C_{T_1} - \pi_2 C_{T_1})}{(\pi_1 C_{T_1})}$	12.5	10.3	11.9
Actual Target Fees minus Hypothetical Target Fees $(\pi_2 C_{T_2})-(\pi_1 C_{T_2})$			
4. Research and development	64.9	1.0	65.9
5. Non-research and development	128.6	15.7	144.3
Total	193.5	16.7	210.2
6. Percentage of actual target fees $\frac{(\pi_2 C_{T_2} - \pi_1 C_{T_2})}{(\pi_2 C_{T_2})}$	10.0	8.0	9.8

conclude that the WGLS resulted on average in target fees about 10 percent higher than they otherwise would have been. Contracts held by Sample A firms increased more than the fees on the contracts Sample B firms held, using either calculation.

ACTUAL AND TARGET FEE RATES

The data and analysis to this point have dealt with "going in" or target fees. These differ from the "coming out" or actual fees contractors earn. Data on actual fees on some, but not all, negotiated contracts are reported by contracting officers; but there are reasons for suspecting the completeness and timeliness of the data. In particular, observations in the post-1964 period for Sample A are very scarce. Thus, any analysis of actual fee data must be viewed skeptically; nonetheless, there are some instructive relationships between "going in" and "coming out" rates on contracts for the two periods. The relationship between average actual and target fee rates and some details about the sample of actual fees is shown in Table 11.

Based on the present sample, the average actual and target fee rates in the pre-WGLS period were identical for Sample A; in the post-WGLS period, it would appear that mean actual fee rates were less than average target rates by 2 percentage points. Sample B also showed actual rates lower than initial targets in the post-WGLS period; but this same relationship also held in the pre-WGLS period. In both periods, Samples A and B had about the same actual rates.

Table 11

MEAN ACTUAL AND TARGET PROFIT RATES
(In $ million)

	Fee Rates				Initial Target Costs		No. of Contracts	
	Pre-WGL		Post-WGL					
Sample	Initial Target	Actual	Initial Target	Actual	Pre-WGL	Post-WGL	Pre-WGL	Post-WGL
A	.077	.077	.097	.078	9878	563	1325	95
B	.082	.075	.091	.077	6089	1251	1047	361

These averages have a striking feature. Despite the increase in initial target rates, neither sample was able to increase its mean actual profit rate appreciably. Actual fees, on average, did not go up. We must emphasize that this finding is derived from an incomplete and, probably, nonrandom sample. Averages are somewhat misleading, also; there appears to have been an increase in the dispersion of the differences between actual fees and target fees. Also, there appears to have been some change in the frequency of lower-than-target outcomes. For Samples A and B, respectively, Figs. 4 and 5 (pages 38 and 39) show the relationships of average actual profit rates to average target profit rates for portfolios of completed contracts. The post-WGLS scatter is more dispersed. The diagonal line represents equal actual and target rates. For Sample A, before 1964, 24 firms were above the line (i.e., had actual fee rates higher than initial targets) and 32 were below. After 1964, 18 were above and 11 below the line. For Sample B, the figures were 45 above the line and 37 below the line before 1964, and 41 above the line. After 1964, 58 were below the line. For Sample A, actual fee rates higher than target fee rates were more likely after WGLS; for Sample B the opposite is true.

The relationship between actual and target fee rates may be examined by reference to the differences among samples and periods of the ratio between these two variables. Note in Eq. 4 that the R^2 value is very low, implying that the relationship is able to explain little of the variation of the ratio of actual to initial fee rates. However, the coefficient of B is significant in explaining the ratio. Standard errors are shown in parenthesis. In other words, the mean ratio of actual to initial fee rates is higher for the Sample B firms, which are more likely to have actual "coming on" fees similar to the "going in" rates.

$$(4) \quad \frac{A}{I} = .99452 - \underset{(.012)}{.037B} + \underset{(.016)}{.029P} \qquad R^2 = .004,$$

where A = actual fee rate

I = initial fee rate

B = Sample B membership variable { 1 if Sample B; 0 if Sample A

P = post-WGLS period variable { 1 if post-WGLS period; 0 if pre-WGLS period

df = 2276

A more instructive question is how the relationship between actual and initial fee rates has changed with time. To address this question, four regressions were computed, one for each sample in each period. The results, with standard errors shown in parenthesis, are:

$$(5) \quad A_{ao} = -.002 + \underset{(.119)}{.964}\, I_{ao} \qquad R^2 = .504, \; df = 66$$

$$(6) \quad A_{a1} = .011 + \underset{(.400)}{.836}\, I_{a1} \qquad R^2 = .127, \; df = 31$$

$$(7) \quad A_{bo} = .020 + \underset{(.059)}{.638}\, I_{bo} \qquad R^2 = .198, \; df = 474$$

$$(8) \quad A_{b1} = -.004 + \underset{(.104)}{1.042}\, I_{b1} \qquad R^2 = .344, \; df = 194$$

where a = Sample A

b = Sample B

o = pre-WGLS period

1 = post-WGLS period

Other symbols as in Eq. (4)

The interesting feature of this set of equations is the relative R^2 or the amount of variance in the actual fee rates explained by the regression. The R^2s are low, implying that the "going in" rate does not appear to be a good predictor of the "coming out" rate, at least on the basis of this small sample. The Sample A values confirm the visual impression conveyed by Fig. 4 that the Sample A firms after 1964 were more likely to have actual fee rates that differed from

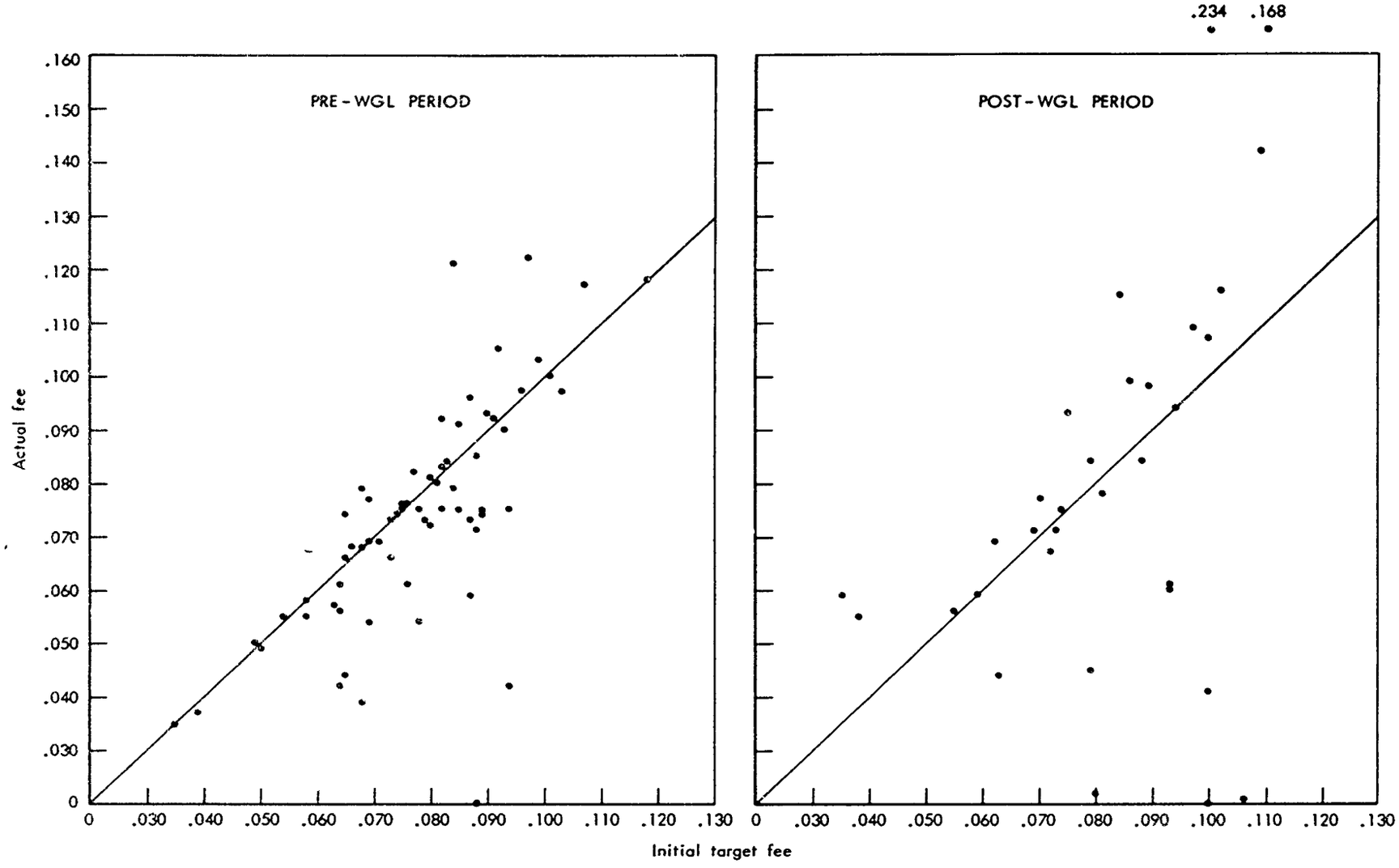

Fig. 4—Target and actual fees—Sample A

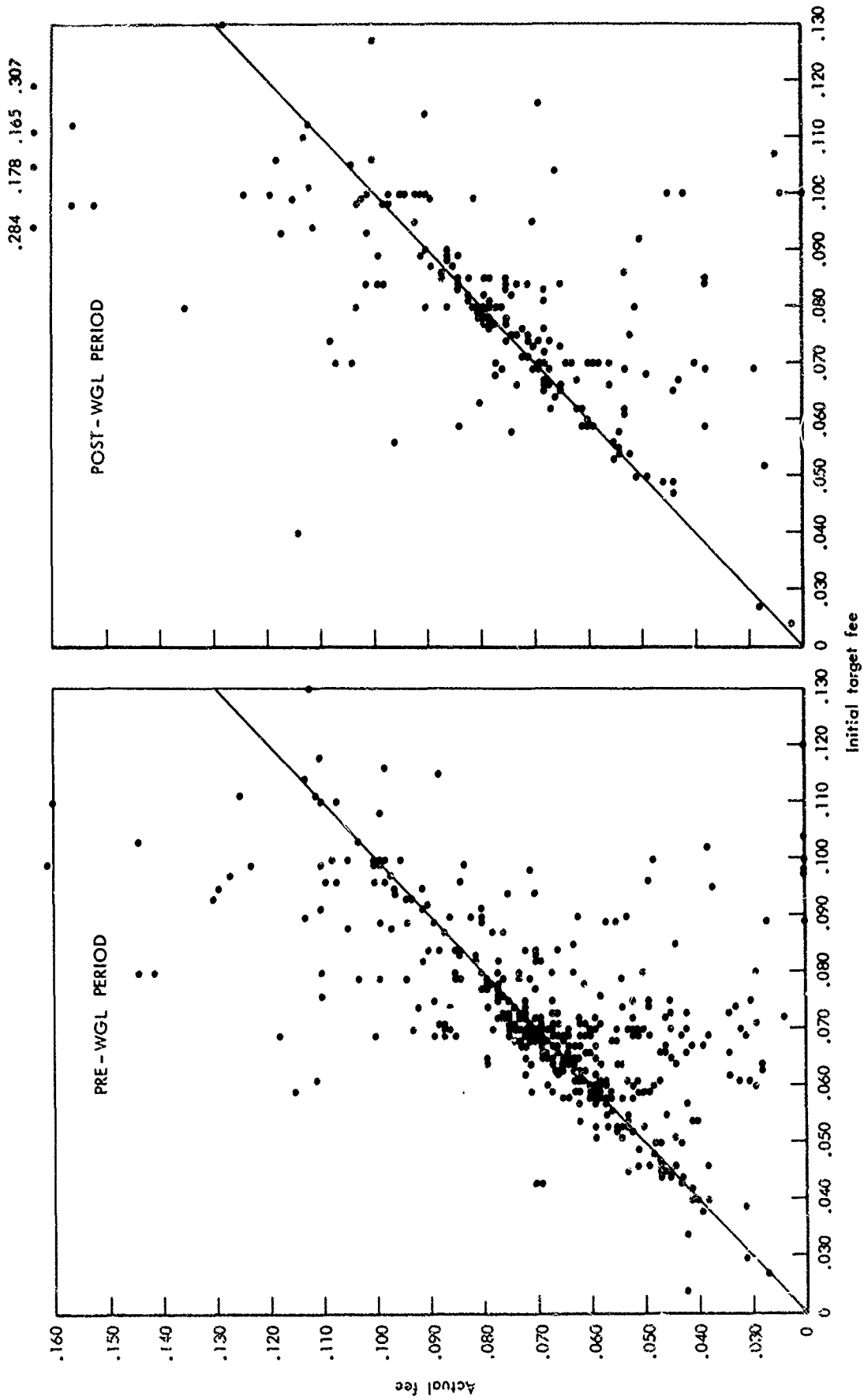

Fig. 5—Target and actual fees—Sample B

initial rates than they were before 1964. The result for Sample B firms was the opposite. Sample B firms were more likely to have actual rates similar to initial rates after the WGLS.

FEES AND CONTRACT RISK

The data on actual fee rates raise the issue of the impact of the DOD drive to shift risk from the Government to contractors through decreased use of cost-plus-fixed-fee contracts, and increased use of incentive and fixed price contracts. Contract types that increase contractor cost-risk exposure carry higher fee rates. Did the target fee rate changes in the two periods reflect increases in contractor's risk exposures?

It is difficult to measure risk, but the issue is so important that a somewhat heroic approach is justified. CPFF contracts were given a weight of 1, CPIF a weight of 2, FFP contracts a weight of 4, and all others a weight of 3. The weighted percentages of initial target costs for each contractor were then summed. The result is an index for each contractor running from 1.000 (all CPFF contracts) to 4.000 (all FFP contracts). While no assertion is made that in any absolute sense FFP contracts are four times as risky as CPFF contracts, the index does provide a seemingly reasonable way of measuring the relative degree of cost risk of various contractors, as well as the change in cost-risk exposure over time.*

The ratio between the fee rates for each contractor in the two periods was regressed on the change in the risk exposure index. The results are shown in Eq. (9).

$$(9) \quad \frac{\text{Post-WGLS Fee Rate}}{\text{Pre- WGLS Fee Rate}} = 1.060 - \underset{(.0664)}{.2502}\ SB + \underset{(.0816)}{.1086}\ \frac{\text{Post-WGLS Index}}{\text{Pre- WGLS Index}} \qquad R^2 = .07$$

*The question naturally arises as to whether the regression results depend on the weighting system used. To test this possibility, two alternative weight sets were examined. In the first, the weights were 1.0, 1.25, 1.5 and 1.75 respectively. In the other, the weights were 2.0, 2.5, 3.0, 3.5 respectively. The impacts on the regression values were trivial.

where SB = firm in Sample B

df = 307

The variable showing the increase in the risk index is statistically insignificant. The variable indicating whether the firm was in Sample B is significant, but small. The equation as a whole has no explanatory power. In short, it appears that the change in average target fee rates which accompanied the introduction of the weighted guidelines system was not occasioned by an increase in risk exposure.

Equation (9) addresses the question of whether the changes in target rates reflect the changes in the quantity of FFP, FPI and other contracts that impose more cost risk on the contractor than did the CPFF contracts more common in past years. A different issue is the changes in the ratios of actual fee rates to initial fee rates. The scarcity of completed risk-type contracts let during the post-WGLS period precludes explanation of this issue at this time.

SUMMARY

Overall, contractors in the post-WGLS period had higher target fees than in the pre-1964 period. The increase in actual realized fee rates was, however, insignificant. Individual experiences differed. Some contractors experienced sharp declines in the average target fee rate of their negotiated contract portfolios. But, taking all contractors together, there was a general increase in average target fees.

Contractors with large portfolios appear to have done relatively better than those with small portfolios. Sample A, which contains many very large Government contractors, had on average a much larger change in profit rates than Sample B, which contains many smaller contractors. While both groups generally improved their target fee rates after 1964, Sample A generally did better.

Using total negotiated defense procurements as the base, the weighted guidelines system clearly led to an increase in total target fees, even allowing for the types of goods and services purchased and

the types of contracts used. The effect would seem to lie in a range from 8 to 12.5 percent increase in total fees. On the basis of the small sample of completed contracts available, this increase in target fees was not translated into an increase in actual fees. Nor do actual fees demonstrate the difference between the two samples shown by target fees.

It does not appear that the increase in the average fee rate for portfolios is due to an increase in the risk-exposure of firms derived from the relative increase in fixed price and incentive contracts. No statistical relationship between these two occurrences could be discovered.

IV. THE IMPACT OF FEE CHANGES ON PROFITS

An improvement in portfolio target fee rates provides an opportunity for improved rates of return on investment in the defense sector; but it does not necessarily lead to higher profit rates, i.e., rates of return on investment. The difference between actual and target rates was discussed earlier. Other conditions can also lead to a difference between the rate of profits on cost and on the rate of return on assets. An increase in the average portfolio target fee is compatible with a decrease in the rate of return on investment, provided there is a sufficient increase in nonallowable costs. Or, the capital-output ratio of the firm may be increasing at a rate sufficient to offset the improvement in fees.

Even assuming that there were no such changes, an increased level of fees would have different impact on various defense contractors. Some firms sell most of their output by negotiated governmental contracts. For these, any change in profit policy would be expected to have a major impact on the firm's overall financial condition. Other contractors have relatively little business of this type. For these, any change in profit policy might be trivial, viewed from the overall position of the firm. This section will explore these issues to the extent permitted by the data available on rates of return on capital.

CHANGES IN FEES AND PROFITS

Let us first consider the implications of the fee rate changes for profits on assets. A prime consideration is the turnover -- the relationship between capital and sales.* There is a wide variation in turnovers in the defense sector. Thus, a two-percentage point increase in average portfolio fee rates will mean a far different thing for some firms than for others.

This diversity is illustrated in Fig. 6. Average corporate turnover rates could be found from publicly available sources for 64 firms

---

*Recall the ratio between fee rates and rate of return on investment, $\frac{\pi}{K} = \frac{\pi}{S} \cdot \frac{S}{K}$

(37 Sample A and 27 Sample B) included in the profit history data file during both periods.* For these firms, the actual change in target fee rates was multiplied by the turnover rate to get a hypothetical change-in-profit rate on assets.** This procedure implies a constant capital-intensity among a firm's profits, which is obviously unrealistic. Moreover, it unrealistically assumes that civilian and military work is equally capital-intensive. Considering progress payments and Government furnished capital, it is probable that defense work will have a larger turnover rate than civilian business.

Figure 6 plots the actual change in portfolio target fee rate against the hypothetical change in assets expected on the basis of the firm's turnover rate. The solid line defines a capital turnover of 1. Note that for most firms in the sample, capital-intensities were such that a change in fee rate would be expected to yield a greater-than-proportional change in profit on assets. Moreover, note that a number of firms in Sample A had both large changes in fee rates and high turnovers, so the hypothetical result should have been some very substantial increases in the profit rate on assets.

The significant point is that this hypothetical relationship is not reflected in the actual data. Figure 7 plots the actual change in profits on assets to the change in target fee rates. Note the differences between Figs. 6 and 7. Apparently, there is no particular relationship between the improvement in the rate of return on assets implied by the improvement in corporate fee rates, and the actual rates of return reported on corporate income statements. This impression is confirmed by Eq. (10).

$$(10) \quad \Delta\pi = -.151 + \underset{(6.88)}{1.317}\Delta F \qquad R^2 = .001 \quad df = 62$$

---

*Rate of return data were obtained from the Standard and Poor Compustat tapes.

**The scales are changes in fee rates so that .01, for example, represents a change say from .08 to .09 or from .04 to .05 and all equivalent changes.

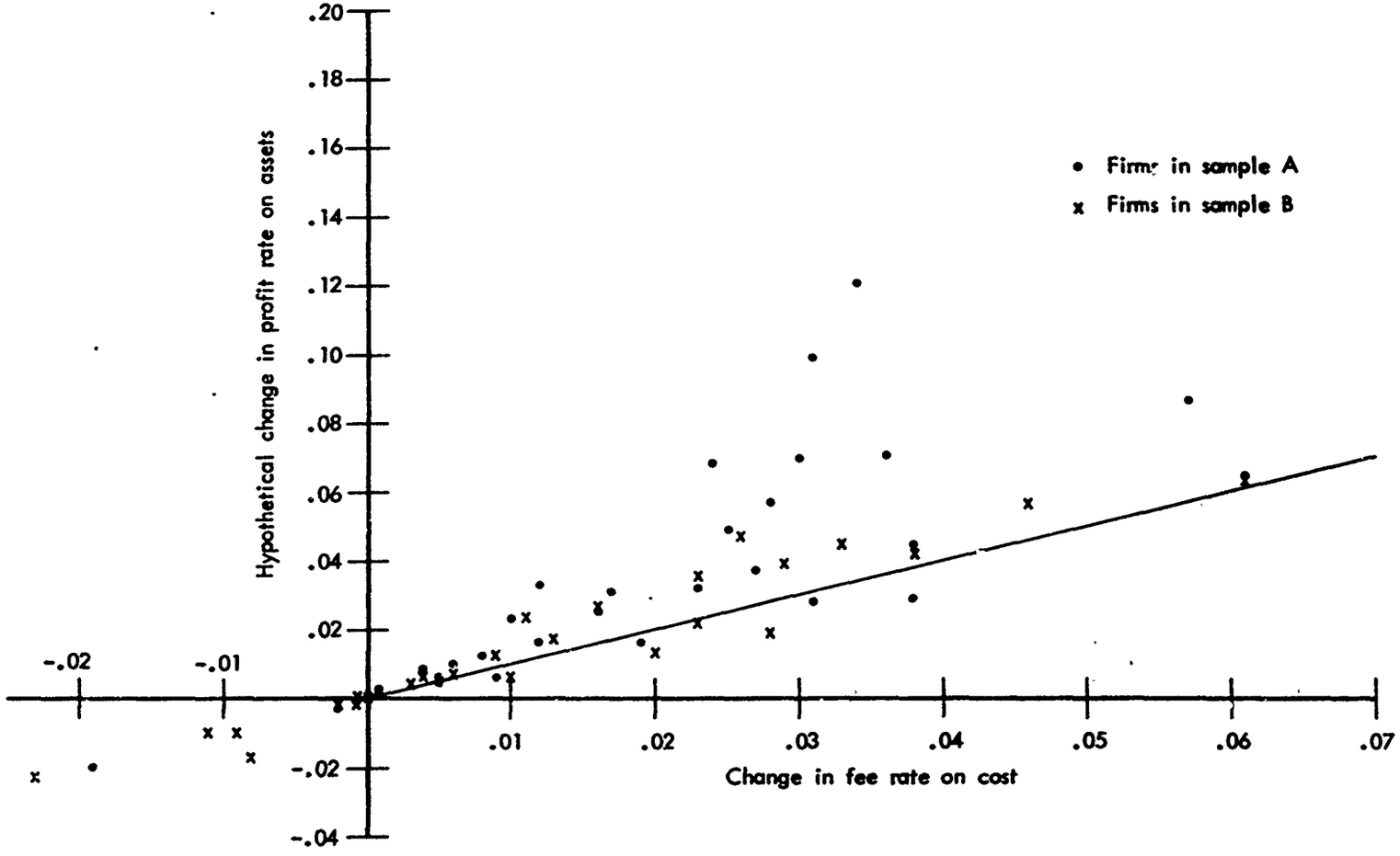

Fig. 6 -- Changes in fee rates on target cost and profits on assets

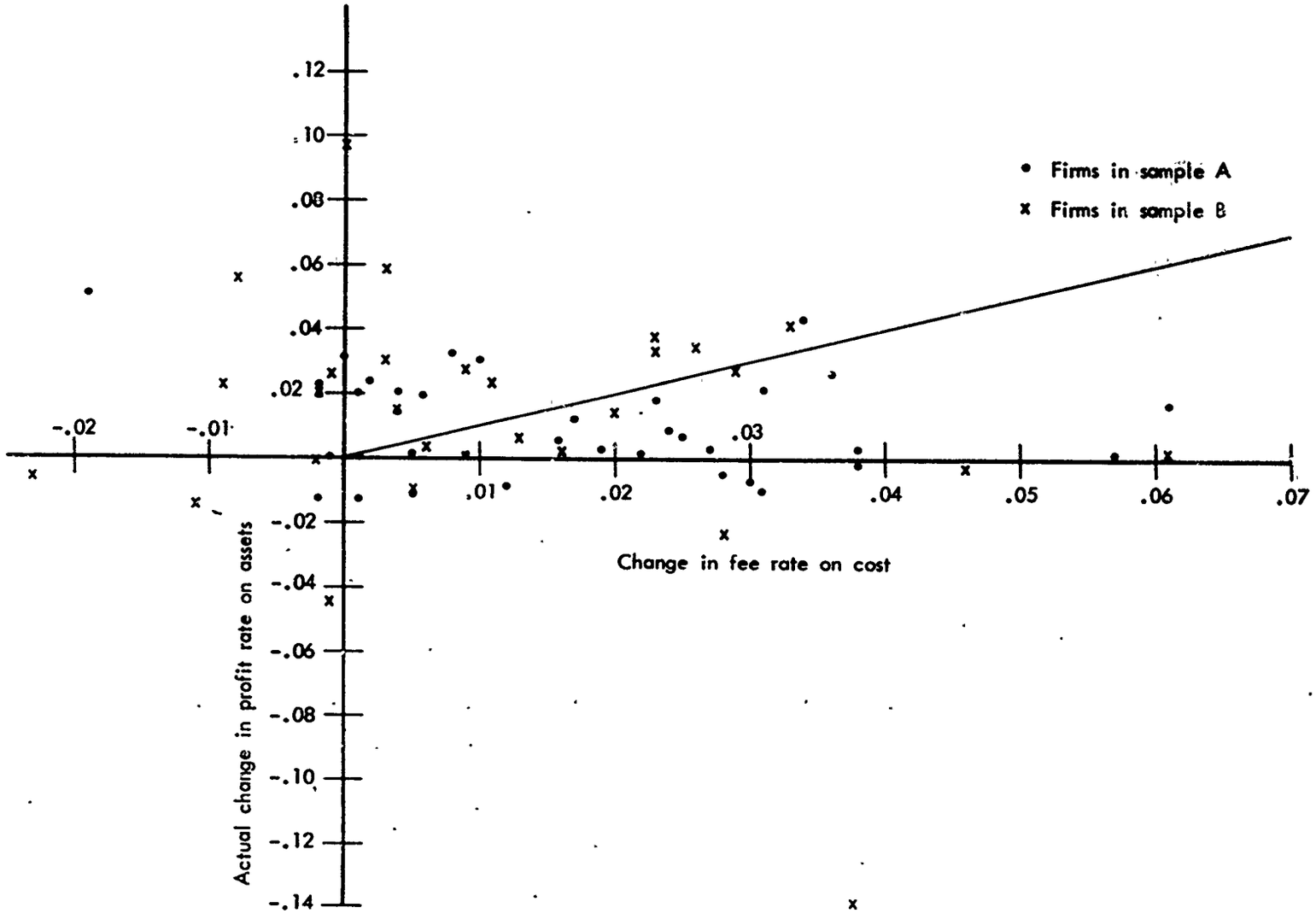

Fig. 7 -- Changes in actual fee and profit rates

where π = average rate of return on assets

F = average portfolio target fee rates

Δ = change between pre- and post-weighted guideline periods. Standard error is shown in parenthesis.

Running the regression separately for each sample did not affect the results.

Using actual fee rates instead of target fee rates does not increase the relationship between fees and profits on assets, as Eq. 11 shows.

$$(11) \quad \Delta\pi = .014 - \underset{(.064)}{.081\Delta F^{*}} \qquad R^2 = .07, \quad df = 22$$

where F^{*} = change in average portfolio of actual fee rates.

For the 23 firms for which sufficient data were available, there appears to have been no uniform or significant association between the improvement in fees resulting from implementation of the WGLS and the earnings of those contractors on invested capital.

One possible reason for these results might be the previously mentioned differences in the relative importance of negotiated defense contracts to the various firms. The samples include firms whose defense sales are very important components of their outputs, and firms to which negotiated defense business is trivial. To check this possibility, Eqs. (10) and (11) were recomputed for those firms where data were available, adding the percentage of Government business to the firm's total sales.* All but two firms were from Sample A. The results, shown in Eqs. (12) and (13), indicate no particular relationship between the return on assets between the pre- and post-WGLS period, or between profit improvement and the percentage of the firm's total business performed for the Government.

$$(12) \quad \Delta\pi = .017 - \underset{(.148)}{.099\Delta F} - \underset{.0009}{.0001G} \qquad R^2 = .01, \quad df = 34$$

*The data were compiled by James W. McKie from public sources.

$$(13) \quad \Delta\pi = .016 - .069\Delta F - .0001G \qquad R^2 = .06$$
$$\qquad\qquad\qquad\quad (.072) \quad (.001) \qquad\quad df = 17$$

where G = percentage of government business.

After introduction of the WGLS, target fees went up and some firms were able to convert the increase into substantial increases in corporate rates of return on assets. Other firms could not. There is no simple explanation of this difference. What appears to have happened is that the factors of changes in allowable cost, changes in rates of investment, and changes in the relative risk of a difference between actual and target profits combined in some complex pattern. There appears to be no simple relationship between changes in fees and profits.

In short, if the goal of the WGLS was to increase the rate of return on capital in the defense industries, the impact is hard to see; and--at best--was scattered and nonuniform. Clearly, the average of the target fees in most contractor's portfolios increased. These increases, however, were apparently unrelated to changes in the actual fees earned, or to changes in the overall corporate profitability of the leading contractors.

V. CONCLUSIONS

SUMMARY OF FINDINGS

1. The weighted guidelines system led to higher average portfolio target fee rates, aggregating individual contracts by contractors.

2. Sample A (the firms on the list of 100 largest defense contractors in 1967) had a relatively larger increase in target fee rates than Sample B (all other firms). In the pre-WGLS period, the average target fee rate was 7.7 percent for Sample A and 8.2 percent for Sample B. Post-WGLS rates were 9.7 percent for Sample A and 9.1 percent for Sample B.

3. There were substantial differences in the experiences of individual firms. About a quarter of the firms in each sample had a decline or no change in average portfolio target rates. Nonetheless, in general, Sample A firms did better throughout the entire distribution of profit rates, except at the extreme high level of rates where there were more Sample B firms.

4. There was considerable dispersion among the changes in average fee rates for different products and types of contracts. Nonetheless, an index number analysis reveals an independent effect from the implementation of the WGLS. The WGLS resulted in an approximate 10-percent increase in target fees for post-WGLS procurements.

5. Average realized fee rates ("coming out" rates) -- on the basis of a small and possibly biased sample -- appear to have remained about the same. Moreover, on average, actual or "coming out" fee rates for the two samples are much more similar than are the target fee rates.

6. Considering the differences between the turnover rates of contractors, there should have been a generally multiplied effect of the higher fee rates on profit rates on investment. In fact, there does not seem to be any simple relationship between changes in target fees or actual fees and changes in rate of return on investment.

IMPLICATIONS

If the goal of the WGLS was to increase profit <u>opportunities</u>, regardless of whether they were or were not achieved, by providing higher

levels of target fees, then the objective was reached, as most firms increased average target fee rates. If the goal was to provide a wider distribution of average fees, then this goal too was achieved. It should be noted, however, that while all classes of firms on average benefitted, the larger contractors benefitted more.

If the goal was to increase actual fees, rather than target fees, it appears that the goal was not achieved, although the evidence here is not sufficient to permit a firm judgment. If the goal was to raise the profitability of defense investment, then the results appear to have been mixed, and on the whole unsuccessful.

The profit results may have been because contractors chose to incur considerable nonallowable costs, or because they were investing in anticipation of future demand. A high enough rate of anticipatory investment would lead to low current rate-of-return figures. Unfortunately, the data available on rates of return are insufficient to explore these issues.

The results, however, probably reflect something different--the shotgun nature of the present cost-based profit system, under which the only way to influence profits is to influence fees. These changes have widely different impacts on various firms, depending upon their market situation, contracting procedures and, particularly, their capital structure. Thus, with the present cost-based profit system, very diffuse and widely differing rates-of-return on investment occur because of changes in fee policy.

If the objective of fee policy is to assure the financial health of the defense industry through adjustment of profit levels, the results of introducing the weighted guidelines system raise questions about its effectiveness. Perhaps what is needed is to replace the present shotgun approach with a more rifle-like system. These thoughts, however, lead into new areas which are not directly related to the history analyzed here.

BIBLIOGRAPHY

Assistant Secretary of Defense (Comptroller), Directorate for Statistical Services, Profit Rates on Negotiated Prime Contracts.

Bell, R. C., and R. B. Garr, An Analysis of the Motivational Effects of Weighted Guidelines, School of Systems and Logistics, SSLSR-35-68, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, 1969.

Fisher, I. N., and G. R. Hall, Risk and the Aerospace Rate of Return, The RAND Corporation, RM-5440-PR, December 1967.

-----, Defense Profit Policy in the United States and the United Kingdom, The RAND Corporation, RM-5610-PR, October 1968.

Hall, G. R., Defense Procurement and Public Utility Regulation, The RAND Corporation, RM-5485-PR, September 1967.

Miller, J. P., Pricing of Military Procurements, Yale University Press, New Haven, Connecticut, 1949.

Osborn, R. C., "Background and Evolution of the Renegotiation Concept," in J. F. Weston (ed.), Procurement and Profit Renegotiation, Wadsworth Publishing Company, Inc., San Francisco, 1960.

Renegotiation Board, Tenth Annual Report, 1965, U.S. Government Printing Office, Washington, D.C., 1966.

U.S. Congress, Senate, Committee on Government Operations, Permanent Subcommittee on Investigations, Pyramiding of Profits and Costs in the Missile Procurement Programs, U.S. Government Printing Office, Washington, D.C., 1964.

DOCUMENT CONTROL DATA

1. ORIGINATING ACTIVITY	2a. REPORT SECURITY CLASSIFICATION
THE RAND CORPORATION	UNCLASSIFIED
	2b. GROUP

3. REPORT TITLE

THE IMPACT OF THE WEIGHTED GUIDELINES PROFIT SYSTEM ON DEFENSE CONTRACT FEES

4. AUTHOR(S) (Last name, first name, initial)

Hall, G. R.

5. REPORT DATE	6a. TOTAL NO. OF PAGES	6b. NO. OF REFS.
December 1969	60	---

7. CONTRACT OR GRANT NO.	8. ORIGINATOR'S REPORT NO.
F44620-67-0045	RM-6183-PR

9a. AVAILABILITY/LIMITATION NOTICES	9b. SPONSORING AGENCY
DDC-1	United States Air Force Project RAND

10. ABSTRACT

An examination of the defense contract fees negotiated by the DOD and how they have changed since the introduction in 1964 of the weighted guidelines system (WGLS) for computing fees. Target fee rates on 10,054 defense contracts negotiated between 1959 and 1967 were examined, as well as the actual fee rates and the earning on contractors' assets. The study shows that the WLGS has resulted in higher average target profit rates, although there is considerable dispersion in average fee rate changes for different products and types of contracts, with the larger firms generally reaping the greater benefits. Actual fee rates--on the basis of a small sample--seem to indicate less variance between large and small firms and show less overall increase. No simple relationship seems to exist between changes in target fees and changes in rate of return. Profit opportunities were increased, but raising the profitability of defense investment seems to have been, on the whole, unsuccessful.

11. KEY WORDS

Cost estimates
Procurement
Department of Defense
Military contracts
Industry